

**Iowa Public Employees'
Retirement System
2001 - 2005 Experience Study**

June 2006



A MILLIMAN GLOBAL FIRM

Milliman

Consultants and Actuaries

**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

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June 15, 2006

Investment Board
Iowa Public Employees' Retirement System
7401 Register Drive
Des Moines, IA 50321

Dear Members of the Board:

It is a pleasure to submit this report of our investigation of the experience of the Iowa Public Employees' Retirement System for the period of June 30, 2001 through June 30, 2005.

The actuarial valuation of IPERS as of June 30, 2006, will be used to analyze the funding status of the system, for analyzing the sufficiency of employer contribution rates, for disclosing employer liabilities on financial statements, and for analyzing the fiscal impact of proposed legislative amendments.

The purpose of this report is to communicate the results of our review of the actuarial methods and the economic and demographic assumptions to be used in the completion of the upcoming valuation. A few of our recommendations represent changes from the prior methods or assumptions, and are designed to better anticipate the emerging experience of the System. Actual future experience, however, may differ from these assumptions.

In preparing this report, we relied without audit on information supplied by IPERS' staff. In our examination, we have found the data to be reasonably consistent and comparable with data used for other purposes. It should be noted that if any data or other information is inaccurate or incomplete, our calculations might need to be revised. We would like to acknowledge the help given by IPERS staff in the preparation of this report.

We hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

We further certify that the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* and No. 35, *Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations*.



Milliman has been engaged by IPERS as an independent actuary. Any distribution of this report must be in its entirety, including this cover letter, unless prior written consent is obtained from Milliman.

Milliman's work product was prepared exclusively for the use or benefit of IPERS for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning IPERS' operations, and uses IPERS data, which Milliman has not audited. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

We look forward to our discussions and the opportunity to respond to your questions and comments at your next meeting.

I, Patrice A. Beckham, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Brent A. Banister, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Patrice A. Beckham, F.S.A.
Consulting Actuary

Brent A. Banister, F.S.A.
Actuary

**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
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Section 1

Executive Summary

The purpose of an actuarial valuation is to provide a timely best estimate of the ultimate costs of a retirement system. Actuarial valuations of IPERS are prepared annually to determine whether the statutory contribution rate will be sufficient to fund the System on an actuarial basis, i.e. the current assets plus future contributions, along with investment earnings will be sufficient to provide the benefits promised by the System to current members. The valuation requires the use of certain assumptions with respect to the occurrence of future events, such as rates of death, termination of employment, retirement age and salary changes to estimate the obligations of the System.

The basic purpose of an experience study is to determine whether the actuarial assumptions currently in use are accurately predicting actual emerging experience. This information, along with the professional judgment of System personnel and advisors, is used to evaluate the appropriateness of continued use of the current actuarial assumptions. When analyzing experience and assumptions, it is important to realize that actual experience is reported short term while assumptions are intended to be long term estimates of experience.

At the request of IPERS, Milliman, Inc. performed a study of the experience of the Iowa Public Employees' Retirement System (IPERS), during the period June 30, 2001 through June 30, 2005. This report presents the results and recommendations of our study, which if approved, will be implemented with the June 30, 2006 actuarial valuation of the System.

There are three different membership groups in IPERS:

1. Regular members
2. Special Services Group 1 and
3. Special Services Group 2.

The benefit provisions for both Special Services groups are very similar and the size of the groups is relatively small. Therefore, for purposes of analyzing experience, the data for the Special Services groups has been aggregated. Results are shown for Regular members and Special Services members in the discussion of demographic assumptions.

ACTUARIAL METHODS

There are three key actuarial methods that are required to complete the annual actuarial valuation. They are:

Actuarial Cost Method: Entry Age Normal
Asset Valuation Method: 75% Expected/25% Actual
Amortization Method: Level Percent of Payroll

We are not recommending any change to the actuarial methods at this time.



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An asset smoothing method (also called an asset valuation method) is used to “smooth out” the market volatility that occurs in the market value of assets. IPERS has historically used a smoothing method. The current method is a weighted average of 75% of the expected value and 25% of the actual market value. While the current method is reasonable and acceptable, we believe it is an appropriate time to consider whether there are other asset smoothing methods that might be more optimal than the current method. In our opinion, such analysis should include the stochastic modeling of future investment returns and the impact of various smoothing methods on the actuarial contribution rate/years to amortize.

Given that an Asset/Liability Study is scheduled to be performed next year, which will incorporate stochastic modeling of both assets and liabilities, it seems that would be an opportune time to perform additional analysis on various smoothing methods. Therefore, it is our recommendation that the A/L Study include a study of the asset smoothing method.

ACTUARIAL ASSUMPTIONS

The actuarial valuation process utilizes two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its impact on IPERS. Demographic assumptions are based on the emergence of the specific experience of IPERS members.

Economic Assumptions

There are two related changes recommended in the economic assumptions, as shown below:

Assumption	Current	Recommended
Inflation	3.50%	3.25%
Interest Credited on Contribution Balances	4.25%	4.00%
Investment Return	7.50%	7.50%
Wage Growth	4.00%	4.00%

We are recommending a small decrease in the inflation assumption from 3.50% to 3.25%. The law also provides that the interest rate credited on member contribution balances will be 1% above the rate credited on a one year Certificate of Deposit (CD). Because the interest rate on a one year CD is dependent on inflation, the inflation assumption also impacts the assumed rate of interest on contribution balances. Therefore, the assumption for the interest credit on contribution balances is lowered to 4.00%.

Demographic Assumptions

The period included in this experience investigation includes the years in which the terrorist attack of 9/11 occurred as well as years in which stock market returns were very bad. We believe this has created a situation where the actual experience of the period is probably not representative of future experience. Therefore, we are hesitant to make any significant changes in assumptions based on the observed experience alone. This is particularly true of the assumptions where the individual members have significant control over their situation, such as retirement and termination of employment.



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In addition, we are introducing a new methodology for analyzing the experience, i.e. a “liability weighted” (referred to in this report as “weighted”) approach. The member’s “liability” in the System is generally determined by the benefit amount and age of the member. Most assumptions already reflected differences by age directly. The other factor, benefit amount, is impacted by salary and service. We use these two factors to estimate the member’s relative benefit level and then weight the experience (the exposure and actual occurrences are scaled by salary and service). This approach is particularly insightful when analyzing experience from a non-homogenous group. While we reviewed experience on both a count and liability weighted basis for most decrements, when there was a significant difference between the two, we generally believe the liability weighted experience is more credible. As subsequent studies are performed using the new methodology, we will be in a better position to evaluate experience and make recommended changes. As a result, there are very few changes in assumptions recommended in this study.

In both the last and current studies, we have analyzed the experience separately by group: State, School and All Others (largely Local employers). While there does appear to be some differences in experience by employer group, the use of separate rates for different groups would be a dramatic change for IPERS. Furthermore, the new liability weighted methodology makes the argument for using assumptions by separate employer groups less compelling. We wish to discuss this issue with the Board at the June meeting to determine the appropriate direction to move on this issue in the next experience study.

Salary Scale

The current assumption is based on both age and service. Based on observed data, there is not significant variance by age. In an attempt to simplify the assumption and valuation process, we recommend an assumption based only on service be used.

Disability – Special Services

When new law changes were implemented in July 2000 that provided for different benefits for duty and non-duty related disabilities, disability rates from a similar system with similar provisions were used as a proxy as there was no IPERS experience. Because actual experience has been significantly lower than expected, we recommend reducing the rates.

SUMMARY

The assumptions in this report have been developed in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the Actuarial Standards Board of the American Academy of Actuaries.

To summarize, the recommended changes in assumptions are:

- Lower the inflation assumption from 3.50% to 3.25%
- Lower the assumed interest rate credited on contribution balances from 4.25% to 4.00%
- Change the salary scale from an age and service based assumption to a service based assumption
- For the Special Services groups, reduce both accidental and ordinary disability rates by one-half.

On a related topic, given that the review of all assumptions has been completed, it is an appropriate time for the Board to consider changing the actuarial basis for computing optional form factors. We recommend that the Board study this change and make a decision later this year.



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The estimated financial impact of the recommended changes, as based on June 30, 2005 valuation results, is summarized below. Assumption changes only impact the liabilities and the normal cost rate. Assets are unaffected. The impact on the June 30, 2006 valuation should be similar, as a percent of the liability, but the dollar amount of impact will vary with the change in the underlying liability amount.

	<u>Regular</u>	<u>Special Services 1</u>	<u>Special Services 2</u>
Actuarial Liability (\$M)	\$19,417	\$294	\$529
Inc/(Dec) Due to Assumption Change:			
Interest on Contribution Balances	0	0	0
Salary Scale	58	1	2
Disability	0	(3)	(12)
Net Change	58	(2)	(10)
Estimated Actuarial Liability (\$M)	19,475	292	519
% of the 6/30/05 Actuarial Liability	0.30%	0.68%	1.89%
Normal Cost	9.12%	16.04%	16.16%
Inc/(Dec) Due to Assumption Change:			
Interest on Contribution Balances	(0.01%)	(0.02%)	(0.01%)
Salary Scale	(0.14%)	(0.44%)	(0.27%)
Disability	0.00%	(0.69%)	(1.20%)
Net Change	(0.15%)	(1.15%)	(1.48%)
Estimated Normal Cost	8.97%	14.89%	14.68%
% of the 6/30/05 Normal Cost Rate	(1.64%)	(7.17%)	(9.16%)



Section 2

Introduction

Funding and Valuation Principles

Just as certain investment choices have an associated "investment risk," choices in actuarial assumptions have an associated "actuarial risk." Our responsibility is to consider the impact our work will have on members, employers, and taxpayers (current and future).

Determining the adequacy of the current contribution rates is dependent on the assumptions we use to project the future benefit payments and then to discount the value of future benefits to determine the present values. Thus, it is important that the Board understand the sensitivity of the actuarial calculations to the underlying assumptions.

- § If actual experience shows that the assumptions overestimated the true cost of the plan, justified benefit improvements to members may be inappropriately denied. Also, if the assumptions overstate the true cost, current taxpayers and public employers may be required to bear a burden that rightfully belongs to future taxpayers.
- § If actual experience shows that the assumptions underestimated the true costs, inappropriate benefit increases may be enacted. Also, if the assumptions understate the true cost, future taxpayers may be required to bear a burden that rightfully belongs to the current taxpayers.

The actuarial assumptions do not impact the true cost of the plan benefits; they do impact how the financing and pre-funding of those retirement benefits take place before the true costs can be determined.

The question that needs to be asked in the public sector is: How great an actuarial risk is the Board willing to accept in the actuarial assumptions? If actuarial experience gains materialize, IPERS's funded status will be better than expected. If actuarial experience losses materialize, what legal or other restrictions are applicable? IPERS Funding Policy provides for the fixed contribution rate to pay the normal cost rate and amortize the UAL over no more than 30 years for the regular membership. Actuarial contribution rates are calculated for the Special Services groups using a 30 year amortization of the UAL/(Surplus).

The actuarial assumptions are usually divided into two groups: economic and demographic. The economic assumptions must not only reflect IPERS's actual experience but also give even greater consideration to the long-term expectation of future economic growth for the nation, as well as the global economy. By long term, we are looking at time periods of from 20 to 40, possibly to 60 years - a much longer time frame than usually addressed by investment managers or economists.

The non-economic, or demographic assumptions, are based on IPERS's actual experience, adjusted to reflect trends and historical experience. Thus, the economic assumptions are much more subjective than the demographic assumptions, and the demographic assumptions are much more dependent on the results of the experience studies.



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Overview

This report presents the results of an investigation of the recent actuarial experience of IPERS. We will refer to this investigation as an experience study.

Throughout this report, we refer to "current" and "proposed" actuarial assumptions. The current assumptions are those used for our actuarial valuation of IPERS as of June 30, 2005. These assumptions and methods were adopted by the Board based on IPERS 2001 Experience Study. The proposed assumptions are those we recommend for use in the valuation as of June 30, 2006 and for subsequent valuations until further changes are made.

The choice of economic assumptions (inflation, investment return and wage growth) is discussed in Section 4 of this report. These assumptions are generally chosen on the basis of the actuary's expectations as to the effect of future economic conditions on the operation of IPERS. However, the setting of these assumptions is much more subjective than in setting and recommending the demographic assumptions.

Sections 5 through 11 of this report will show the results of our study of demographic assumptions and will be discussed with the Board at the June 27, 2006 Investment Board meeting. These assumptions are much more deterministic than the economic assumptions. The exhibits are detailed comparisons between actual and expected events (death, retirement, termination, etc.) on both the current and proposed bases. These graphs are included in the Appendices for your reference.

For each type of assumption, graphs show the actual, the expected and proposed rates, usually by a combination of gender, years of service and age group. The exhibits also show the total numbers of actual and expected decrements based on the current assumption and the proposed, if any. Ratios larger than 100% on the current basis indicate that the rates may need to be raised; ratios smaller than 100% indicate that rates may need to be lowered. Note that in the graphs in cases where no change is being proposed, the current and proposed rates are the same and only one line is visible.

IPERS' members are differentiated by class, i.e. the employment status of a member. There are three different membership groups (classes) in IPERS:

1. Regular members;
2. Special Services Group 1 and;
3. Special Services Group 2.

The benefit provisions for both Special Services groups are very similar and the size of the groups is relatively small. Therefore, for purposes of analyzing experience, the data for the Special Services groups has been aggregated. Experience by class is reflected in the demographic assumptions.



Our Philosophy

Similar to an actuarial valuation, the calculation of actual and expected experience is a fairly mechanical process. From one actuary to another, you would expect to see very little difference. However, the setting of assumptions is a different story, as it is more art than science. In this report, we may recommend revised assumptions. To better understand our thought process, here is a brief summary of our philosophy:

- **Don't overreact:** When we see significant changes in experience, we generally do not adjust our rates to reflect the entire difference. We will generally recommend rates somewhere between the old rates and the new experience. If the experience during the next study shows the same result, we will probably recognize this trend at that point. On the other hand, if the experience returns closer to its prior level, we will not have overreacted, minimizing volatility in the member and employer contribution rates.
- **Anticipate Trends:** If there is an identified trend that is expected to continue, we believe that this should be recognized. An example of this is the retiree mortality assumption. It is an established trend that people are continuing to live longer; therefore, we prefer to build in a margin to reflect future decreases in mortality rates.
- **Simplify:** In this report we describe what factor affects each assumption. In general, we attempt to identify which factors are significant and eliminate the ones that do not significantly improve accuracy.

Actuarial Standard of Practice No. 27: Selection of Economic Assumptions

The Actuarial Standards Board has adopted Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This standard provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans, such as IPERS. ASOP No. 27 is effective for any valuation with a measurement date on or after July 15, 1997.

Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one “right answer”, the standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy this standard.

After completing the selection process, the actuary should review the set of economic assumptions for consistency. This may require the actuary to use the same inflation component in each of the economic assumptions selected. However, if a change occurs in one assumption, the actuary needs to consider if the change would modify other economic assumptions as well.



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An actuary's best-estimate range with respect to a particular measurement of pension obligations may change from time to time due to changing conditions or emerging plan experiences. The actuary may change assumptions frequently in certain situations, even if the best-estimate range has not changed materially, and less frequently in other situations. Even if assumptions are not changed, the actuary needs to be satisfied that each of the economic assumptions selected for a particular measurement complies with the new *Actuarial Standard of Practice No. 27*.

In our opinion, the proposed economic assumptions have been developed in accordance with ASOP No. 27.

Actuarial Standard of Practice No. 35: Selection of Demographic Assumptions

Actuarial Standard of Practice No. 35 (ASOP 35) governs the selection of demographic and other non-economic assumptions for measuring pension obligations. This standard is effective for any measurement date occurring after September 15, 2001. *ASOP 35* states that the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

ASOP No. 35 Steps

The actuary should follow the following steps in selecting the demographic assumptions:

1. Identify the types of assumptions. Types of demographic assumptions include but are not limited to retirement, mortality, termination of employment, disability, election of optional forms of payment, administrative expenses, family composition, and treatment of missing or incomplete data. The actuary should consider the purpose and nature of the measurement, the materiality of each assumption, and the characteristics of the covered group in determining which types of assumptions should be incorporated into the actuarial model.
2. Consider the relevant assumption universe. The relevant assumption universe includes experience studies or published tables based on the experience of other representative populations, the experience of the plan sponsor, the effects of plan design, and general trends.
3. Consider the assumption format. The assumption format includes whether assumptions are based on parameters such as gender, age, service or calendar year. The actuary should consider the impact the format may have on the results, the availability of relevant information, the potential to model anticipated plan experience, and the size of the covered population.
4. Select the Specific Assumptions. In selecting an assumption the actuary should consider the potential impact of future plan design changes as well as the factors listed above.
5. Evaluate the Reasonableness of the Selected Assumption. The assumption should be expected to appropriately model the contingency being measured. The assumption should not be anticipated to produce significant actuarial gains or losses.



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ASOP No. 35 General Considerations and Application

Each individual demographic assumption should satisfy the criteria of *ASOP 35*. In selecting demographic assumptions the actuary should also consider the internal consistency between the assumptions, materiality, cost effectiveness, and the combined effect of all assumptions. At each measurement date the actuary should consider whether the selected assumptions continue to be reasonable, but the actuary is not required to do a complete assumption study at each measurement date. In our opinion, the demographic assumptions recommended in this report have been developed in accordance with *ASOP 35*.



Section 3

Actuarial Methods

ACTUARIAL COST METHOD

The financing of a pension plan requires that contributions be made in an orderly fashion while a member is actively employed, so that the accumulation of these contributions, together with investment earnings should be sufficient to provide promised benefits and cover administration expenses. The actuarial valuation is the process used to determine when money should be contributed; i.e., as part of the budgeting process.

The actuarial valuation will not impact the amount of benefits paid or the actual cost of those benefits. In the long run, actuaries cannot change the costs of the pension plan, regardless of the funding method used or the assumptions selected. However, actuaries **will** influence the incidence of costs by their choice of methods and assumptions.

The valuation or determination of the present value of all future benefits to be paid by the System reflects the assumptions that best seem to describe anticipated future experience. The choice of a funding method does not impact the determination of the present value of future benefits. The funding method, determines only the incidence of cost. In other words, the purpose of the funding method is to allocate the present value of future benefits determination into annual costs. In order to do this allocation, it is necessary for the funding method to “break down” the present value of future benefits into two components: (1) that which is attributable to the past (2) and that which is attributable to the future. The excess of that portion attributable to the past over the plan assets is then amortized over a period of years. Actuarial terminology calls the part attributable to the past the “past service liability” or the “actuarial liability”. The portion of the present value of future benefits allocated to the future is commonly known as “the present value of future normal costs”, with the specific piece of it allocated to the current year being called “the normal cost”. The difference between the plan assets and actuarial liability is called the “unfunded actuarial liability”.

Two key points should be noted. First, there is no single “correct” funding method. Second, the allocation of the present value of future benefits and hence cost to the past for amortization and to the future for annual normal cost payments is not necessarily in a one-to-one relationship with service credits earned in the past and future service credits to be earned.

There are various actuarial cost methods, each of which has different characteristics, advantages and disadvantages. A brief summary of the most commonly used cost methods is included below.

i Entry-Age-Normal Cost Method

The rationale of the entry age normal (EAN) funding method is that the cost of each member's benefit is determined to be a level percentage of his salary from date of hire to the end of his IPERS' covered employment. This level percentage multiplied by the member's annual salary is referred to as the normal cost and is that portion of the total cost of the employee's benefit which is allocated to the current year. The portion of the present value of future benefits allocated to the future is determined by multiplying



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this percentage times the present value of the member's assumed earnings for all future years including the current year. The entry age normal actuarial liability is then developed by subtracting from the present value of future benefits that portion of costs allocated to the future (present value of future normal costs). To determine the unfunded actuarial liability, the value of plan assets is subtracted from the entry age normal actuarial liability. The current year's cost to amortize the unfunded actuarial liability is developed by applying an amortization factor.

It is to be expected that future events will not occur exactly as predicted by the actuarial assumptions in each year. Actuarial gains/losses from experience under this actuarial cost method can be directly calculated and are reflected as a decrease/increase in the unfunded actuarial liability. Consequently, the gain/loss results in a decrease/increase in the amortization payment, and therefore the contribution rate.

i Projected Unit Credit

The projected unit credit (PUC) funding method defines the actuarial liability to be the value of the employee's accrued benefit based upon his service as of the valuation date and his estimated final average earnings at the time he retires or otherwise exits. The normal cost is the present value of benefits accruing during the year with projected salary increases. The unfunded actuarial liability is determined by subtracting the actuarial value of assets from the actuarial liability. The current year's cost to amortize the unfunded actuarial liability is developed by applying an amortization factor.

As with the entry age normal funding method, the actuarial gains and losses that accrue each year modify the unfunded actuarial liability and the payment thereon.

i Aggregate

This cost method does not develop individual normal costs, but calculates a normal cost rate for the entire plan. The total value of future normal costs is found by subtracting the actuarial value of assets from the present value of future benefits. This amount is then spread as a level percentage of future payroll for the entire group. Gains/losses are included in the present value of future benefits and thereby incorporated into the normal cost percentage for future years. The basic premise of the aggregate cost method is to develop a normal cost which, from the valuation date forward, will fund the whole unfunded portion of the plan's future benefits as a level percentage of payroll over the active members' working lifetime.

This method does not differentiate between past service costs and current costs. Therefore, no actuarial liability exists under the aggregate cost method and actuarial gains and losses are not directly calculated as in the other cost methods.

i Frozen Entry Age

The frozen entry age cost method is a blend of the entry age normal and aggregate cost methods. The unfunded actuarial liability is initially determined using the entry age normal funding method. Each year the unfunded actuarial liability (UAL) is set equal to the expected unfunded actuarial liability. Actuarial gains and losses are not reflected in the amount of the unfunded actuarial liability, but rather are reflected in the normal cost. The frozen actuarial liability is changed only to reflect plan amendments



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and changes in the actuarial assumptions. The amortization payments for the current and all future years are fixed at the time the unfunded actuarial liability is determined. The normal cost is developed similarly to that under the aggregate cost method. The present value of all future benefits is determined and then reduced by the valuation assets and the unfunded frozen actuarial liability. The resulting amount is then spread as a level percentage of future payroll.

IPERS currently uses the Entry Age Normal actuarial cost method. This method tends to develop a normal cost rate which is stable and less volatile even if there are changes in the demographics of the active population. It is used by about 85% of all public sector plans. **We recommend that IPERS continue using the entry age normal method.**

ASSET VALUATION METHOD

In preparing an actuarial valuation, the actuary must assign a value to the assets of the fund. An adjusted market value is often used to smooth out the volatility in the market value. This is because most plan sponsors would rather have annual costs remain smooth, as percentage of payroll or in actual dollars, rather than a cost pattern that is extremely volatile.

The actuary does not have complete freedom in assigning this value. For example, GASB requirements, basic actuarial principles promulgated by the American Academy of Actuaries, and the Internal Revenue Code and its associated regulations on the private employer side require any methodology used in assessing the value of assets to:

- Take into account fair market value,
- Produce a result which is not consistently above or below the fair market value, and
- Not be less than 80% of the actual market value nor more than 120% of the actual market value (private sector only).

These rules or principles prevent the asset valuation methodology from being used to distort annual funding patterns. No matter what asset valuation method is used, it is important to note that, like a funding method or actuarial assumptions, the asset valuation method does not affect the cost of the plan; it only impacts the incidence of cost.

IPERS values assets, for actuarial valuation purposes, based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. This philosophy is consistent with the long-term nature of a retirement system. Under this method, the actuarial value of the assets is the expected value of assets plus 25% of the difference between market value and expected value, where the expected value is last year's actuarial value and subsequent cash flows into and out of the fund accumulated with interest at the valuation rate (7.5%). This is equivalent to using a weighted average of 75% of the expected value and 25% of actual market value.



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An asset smoothing method is used to “smooth out” the market volatility that occurs in the market value of assets. IPERS has historically used a smoothing method. While the current method is reasonable and acceptable, we believe it is an appropriate time to consider whether there are other asset smoothing methods that might be more optimal than the current method. In our opinion, such analysis should include the stochastic modeling of future investment returns and the impact of various smoothing methods on the actuarial contribution rate/years to amortize.

Given that an Asset/Liability Study is scheduled to be performed next year, which will incorporate stochastic modeling of both assets and liabilities, it seems that would be an opportune time to perform additional analysis on various smoothing methods. **Therefore, we recommend the current asset valuation method be retained and the A/L Study include a study of the current and other possible asset smoothing methods.**

AMORTIZATION METHOD

As described above, actuarial liabilities are the portion of the actuarial present value of future benefits that are not included in future normal costs. Thus it represents the liability that, in theory, should have been funded through historical normal costs. Unfunded actuarial liabilities (UAL) exist when actuarial liabilities exceed plan assets. These deficiencies can result from (i) plan improvements that have not been completely paid for, (ii) experience not being as favorable as expected, (iii) assumption changes or (iv) contributions less than the actuarial rate.

There are a variety of different methods that can be used to amortize the UAL. Each results in a different payment stream and therefore the amortization approach utilized will have an impact on the incidence of costs. For each methodology, there are three characteristics:

- The period over which the UAL is amortized,
- The rate at which the amortization amount increases, and
- The number of components of UAL with separate amortization bases.

Statement No. 25 of the Governmental Accounting Standards Board (GASB) sets parameters for all of these characteristics. The maximum amortization period permitted is 30 years. The annual amortization amount can be a level dollar amount or a level percentage of payroll. The UAL may be amortized as one amount or components may be amortized separately.

All non-public pension plans, pursuant to the Internal Revenue Code, must use level dollar amortization to pay off their unfunded actuarial liability for purposes of IRS minimum and maximum funding. This is similar to the method in which a home owner pays off a mortgage. The liability, once calculated, is financed by a constant fixed dollar amount, based on a predetermined number of years, until the liability is extinguished. This results in the liability steadily decreasing while the payments, though remaining level in dollar terms, in all probability decrease as a percentage of payroll. (Even if a plan sponsor's population is not growing or even slightly diminishing, inflationary increases will usually be sufficient to increase the aggregate payroll).



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The rationale behind the level percentage of payroll amortization method is that since normal costs are calculated to be a constant percentage of pay, unfunded actuarial liabilities should be paid off in the same manner. When this method of amortizing the unfunded actuarial liability is adopted, the initial amortization payments are lower than they would be under a level dollar amortization payment method but the payments increase at a fixed rate (4% a year for IPERS) so that ultimately the annual payment far exceeds the level dollar payment. It is expected that total payroll is increasing as rapidly so the amortization payments will remain constant as a percentage of payroll. In the initial years, the level percentage of payroll amortization payment is often less than the interest accruing on the unfunded actuarial liability, meaning that even if there are no experience losses, the unfunded actuarial liability will grow. If the plan sponsor is paying off the unfunded liability over a long period, such as 30 years, it is possible that the unfunded liability will grow for nearly 20 years, gradually reduce so that in the 25th year the unfunded liability is equal to the initial unfunded liability, and still be completely paid off by the 30th year. The increasing unfunded liability may be troubling to various interested parties, but should not be worrisome unless the remaining UAL is actually increasing as a percentage of total covered payroll.

Use of the level percentage of payroll amortization has its advantages and disadvantages. From a budgetary standpoint, it makes sense to develop UAL contribution rates that are level as a percentage of payroll. However, this approach clearly results in slower funding of the UAL.

The amortization period can be either fixed or open. If it is a fixed or closed amortization period, it declines each year. Alternatively if the amortization period is an open or rolling period, the amortization period does not decline but is reset each year.

Regular Membership

Currently, IPERS' payment on the unfunded actuarial liability is the difference between the statutory contribution rate and the normal cost rate. Since both of these numbers are expressed as a "percent of payroll", we feel it is appropriate to use the level percentage of payroll amortization methodology. The result is a determination of the number of years required to amortize the current unfunded actuarial liability in each valuation.

Special Services Groups

The actuarial contribution rate for the Special Services groups is calculated as the normal cost plus a contribution to amortize the UAL/(Surplus) over 30 years as a level percentage of pay. The number of years to amortize has never been formally set by the Board and is not included in IPERS' Funding Policy. We recommend this be discussed further at the June 27, 2006 Board meeting.

We recommend the current amortization methodology be retained.



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Section 4
Economic Assumptions

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* provides guidance to actuaries giving advice on the selection of economic assumptions for measuring obligations under defined benefit plans, such as IPERS. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one “right answer”, the standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with all other economic assumptions over the measurement period.

This section of the report will address the relevant types of economic assumptions used in the actuarial valuation to determine the obligations of IPERS. In our opinion, the economic assumptions recommended in this report have been developed in accordance with ASOP No. 27. The following table summarizes the current and recommended economic assumptions:

	Current Assumption	Proposed Assumption
A. Inflation	3.50%	3.25%
B. Interest on Contribution Balances	4.25%	4.00%
C. Investment Return	7.50%	7.50%
D. Wage Growth	4.00%	4.00%

INFLATION

Use in the Valuation: Inflation as referred to in this report means price inflation. The inflation assumption has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage growth, and payroll increase assumption.

Inflation also has a direct impact on the valuation results. The Iowa Code provides for an increase in the annual dividend for members who retired before July 1990. The maximum annual increase in the dividend is the lesser of 3.0% or the increase in the CPI-U, subject to certain certifications by the actuary. Therefore, the inflation assumption is used directly to develop the assumed increase in the annual dividend payments for this group of retirees. The law also provides that the interest rate credited on member contribution balances



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will be 1% above the rate credited on a one year Certificate of Deposit (CD). Because the interest rate on a one year CD is dependent on inflation, the inflation assumption also impacts the assumed rate of interest on contribution balances.

The long-term relationship between inflation and investment return has long been recognized by economists. The basic principle is that the investor demands a more or less level “real return” – the excess of actual investment return over inflation. If inflation rates are expected to be high, investment return rates are also expected to be high, while low inflation rates will result in lower expected investment returns, at least in the long run.

The effect of inflation is more direct on wages than on investment return. An individual's wages are affected by:

- (1) Promotion and longevity (merit scale)
- (2) Productivity
- (3) Inflation

For actuarial purposes, productivity and inflation are often combined into a single assumption for salaries: the rate of increase in the general wage level of the membership or the wage growth assumption. Our actuarial assumption for salary increases is composed of a merit scale assumption, which reflects the effects of promotion and longevity and the general wage growth assumption.

The current assumption for inflation is 3.50% per year.

Historical Perspective: For our analysis, we have used certain published economic statistics that have been accumulated on a monthly basis over the last 75 years. The data for inflation is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics. The data for periods ending in December of each year is documented in Exhibit 1 at the end of this section.

Although economic activities in general, and inflation in particular, do not lend themselves to prediction on the basis of historical analysis, historical patterns and long term trends are a factor to be considered in developing the inflation assumption.

There are numerous ways to review historical data, with significantly differing results. The tables below show the compounded annual inflation rate for various ten-year periods, and for longer periods ended in December of 2005.

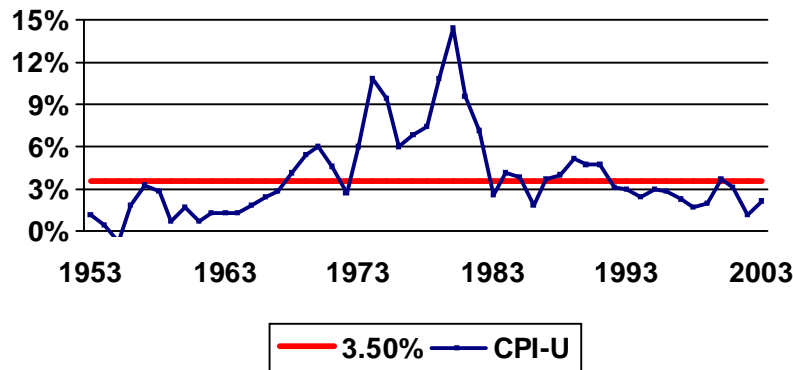
Decade	CPI
1995-05	2.53%
1985-95	3.44%
1975-85	7.00%
1965-75	5.72%
1955-65	1.73%

Period	CPI
1995-05	2.53%
1985-05	3.00%
1975-05	4.31%
1965-05	4.66%
1955-05	4.07%
75 years	3.39%



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History of National CPI-U



Forecasts of Inflation: Since the U.S. Treasury started issuing inflation indexed bonds, it is possible to determine the approximate rate of inflation anticipated by the financial markets by comparing the yields on inflation indexed bonds with traditional fixed government bonds. Current market prices suggest investors expect inflation to be about 2.75% over the next ten years.

Although most economists forecast inflation lower than the current assumption of 3.5%, they are generally looking at a shorter period than is appropriate for a pension valuation. To consider a longer, similar time frame, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the May 2006 report, the annual increase in the CPI over the next 30 years was 2.80%, under the intermediate cost assumptions. The lower cost assumption used 1.80% and the high cost assumption used 3.80%, creating a reasonable range of 1.80% to 3.80%. Each of these assumptions was 20 basis points lower than Social Security's March 2002 report, which was part of the development of the inflation assumption in the last IPERS Experience Study.

Reasonable Range and Recommendation: We believe that a range between 2.00% and 4.00% is reasonable for an actuarial valuation of a retirement system. Given that expectations for lower inflation continue to dominate economic forecasts, including projections for Social Security, we recommend that the long-term assumed inflation rate be lowered to 3.25% per year.

Consumer Price Inflation	
Current Assumption	3.50%
Reasonable Range	2.00% - 4.00%
Recommended Assumption	3.25%



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RATE OF CREDITING INTEREST ON CONTRIBUTION BALANCES

Use In The Valuation: The law provides that the interest rate credited on contribution balances will be 1% above the rate credited on a one year Certificate of Deposit (CD). Because this rate impacts the dollar amount available for refund and the number of guaranteed payments at retirement under Option 2, an assumption must be used to project future contribution balances.

The current assumption is 4.25%. The interest rate credited on Certificates of Deposit is directly impacted by inflation. Rates on short term CDs are generally slightly higher than inflation so this assumption must be consistent with the inflation assumption.

Reasonable Range and Recommendation: Based on the reasonable range developed for the inflation assumption, we believe a reasonable range for the interest rate credited on contribution balances is 2.75% to 4.75%. We recommend the assumption be lowered to 4.00% to be consistent with the change in the inflation assumption.

Interest on Contribution Balances	
Current Assumption	4.25%
Reasonable Range	2.75% - 4.75%
Recommended Assumption	4.00%

INVESTMENT RETURN

Use In The Valuation: The investment return assumption is one of the primary determinants in the calculation of the expected cost of the System's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. This assumption has a direct impact on the calculations of liabilities and contribution rates. The valuation interest rate should represent the long-term rate of return on the actuarial value of assets, considering the fund's asset allocation policy, expected long term real rates of return on the specific asset classes, the underlying inflation rate, and investment and administrative expenses.

The current assumption for investment return is 7.50% per year, net of all investment-related and administrative expenses.

Historical Perspective: One of the inherent problems with analyzing historical data is that the results can look significantly different depending on the time frame used if the year-to-year results vary widely. For example, the unusually low equity returns from 2000 through 2002 have had a remarkable impact on rolling ten-year period returns when compared to just a few years ago. Even though history provides a valuable perspective for setting this assumption, the economy of the past is not necessarily the economy of the future, nor is recent experience necessarily a good predictor for future long term experience.



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For informational purposes only, we have included the following table, which summarizes the rates of return on IPERS assets, since 1981.

Fiscal Year	Return*	Fiscal Year	Return*	Fiscal Year	Return*
1981	0.91%	1991	8.36%	2001	-4.73%
1982	11.26	1992	9.47	2002	-4.94
1983	42.67	1993	10.32	2003	5.59
1984	-0.88	1994	2.85	2004	13.78
1985	28.21	1995	14.77	2005	11.25
1986	25.16	1996	16.88		
1987	11.37	1997	20.51	5 year	3.89
1988	5.94	1998	18.18	10 year	9.93
1989	14.78	1999	13.18	15 year	9.65
1990	8.38	2000	13.05	20 year	10.46

*As reported by IPERS

Method to Determine Best-Estimate Range for Investment Return

Milliman's investment consulting practice has developed a method to determine the best-estimate range for investment return based upon their assumptions for capital markets and the target asset allocation adopted by the IPERS Board. The current target asset allocation is summarized in the following chart:

Asset Class	Target Asset Allocation
Domestic Equities	28%
Non-US Equities	15%
Real Estate	8%
Private Equity	10%
Investment Grade Bonds	34%
High Yield Bonds	5%
Total Portfolio	100%

This method is used to provide the range of assumptions appropriate for compliance with Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This standard defines the Best-Estimate Range as "the narrowest range within which the actuary reasonably anticipates that the actual results, compounded over the measurement period, are more likely than not to fall."

By assuming the portfolio is re-balanced annually and that annual returns are lognormally distributed and independent from year to year, we can develop expected percentiles for the long-term distribution of annualized returns.



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Using properties of the lognormal distribution, we calculate the 25th and 75th percentiles of the long-term total return distribution. This becomes our best-estimate range because 50% of the outcomes are expected to fall within this range and it is centered about the mean.

Using IPERS investment consultant's (Wilshire) capital market assumptions and adjusting for the difference in their inflation assumption (2.25%) and our long term inflation assumption for the valuation (3.25%), this methodology provides a best estimate range of return equal to 7.45% - 10.07%. We also modeled the expected rate of return using the capital market assumptions developed by Milliman's investment consulting practice. The reasonable range was slightly lower than those based on Wilshire's assumption, i.e. 6.87% - 9.51%.

Investment-Related and Administrative Expenses

The investment return used for the valuation is assumed to be net of all investment-related and administrative expenses. The table below shows the ratio of investment and administrative expenses to assets over the last nine years. The expense ratio is calculated as the total expenses divided by the beginning asset balance.

(\$ million)	Investment Expenses	Administrative Expenses	Actl Value Assets (\$M)	Expense Ratio	
				Investment	Administrative
2005	\$48.8	\$8.3	\$17,951	0.27%	0.05%
2004	31.2	8.0	16,951	0.18	0.05
2003	29.9	8.0	16,120	0.19	0.05
2002	37.6	7.6	15,613	0.24	0.05
2001	42.6	7.3	15,112	0.28	0.05
2000	31.0	5.9	14,145	0.22	0.04
1999	34.6	4.6	12,664	0.27	0.04
1998	20.3	4.0	11,353	0.18	0.04
1997	17.4	3.8	10,113	0.17	0.04

This information was taken from IPERS' Comprehensive Annual Financial Reports (CAFR). Administrative expenses remained fairly level around 0.05% of assets. The investment expenses varied over the years, with an average around 0.22%. Based on this data, it seems reasonable to assume that investment and administrative expenses represent about 0.30% of the System's assets.

Reasonable Range and Recommendation: Based on the *ASOP No. 27* guidelines, we conclude that a reasonable range for the gross investment return is 7.45% to 10.07%. This range needs to be lowered to reflect the expenses assumed to be paid from the investment return. Given an assumed expense ratio of 30 basis points, we believe that a range between 7.15% and 9.77% is reasonable for an actuarial valuation of a retirement system with IPERS asset allocation policy. Adjusting for the long term nature of the liabilities, the expectation of lower inflation in the short term and the significance of this assumption in the valuation process, we feel more comfortable closer to the low end of the range.



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Components of Return	Percentile Results		
	25th	50th	75th
Real Investment Return	4.20%	5.50%	6.82%
Assumed Inflation	3.25%	3.25%	3.25%
Total Expenses	(0.30%)	(0.30%)	(0.30%)
Net Investment Return	7.15%	8.45%	9.77%

We recommend that the net investment return assumption remain at 7.5% per year. We believe an investment return assumption of 7.5% per year is consistent with the level of inflation and real rate of return likely to occur over an extended period of time, net of expenses.

Investment Return	
Current Assumption	7.50%
Reasonable Range	7.15% - 9.77%
Recommended Assumption	7.50%

WAGE GROWTH

Use in the Valuation: Estimates of future salaries are based on two types of assumptions. Rates of increase in the general wage level of the membership are directly related to inflation while individual salary increases due to promotion and longevity (referred to as the merit scale) occur even in the absence of inflation. The merit scale will be reviewed with the other demographic assumptions.

As part of determining the System's funding, the amortization period for the unfunded actuarial liability (UAL) is determined, based on amortization payments developed as a level percent of payroll. The general wage increase assumption is used to project covered payroll in future years which determines the years to amortize the UAL.

The current wage growth assumption is 0.50% above the price inflation rate, or 4.00% per year.

Historical Perspective: We have used statistics from the Social Security System on the National Average Wage back to 1951 (please note that 2004 is the most recent published data). For years prior to 1951, we studied the Total Private Nonagricultural Wages as published in *Historical Statistics of the U.S., Colonial Times to 1970*. The data for each year is documented in Exhibit 2 at the end of this section.

There are numerous ways to review this data. For consistency with our observations of CPI, the table below shows the compounded annual rates of wage growth for various 10-year periods, and for longer periods ended in 2004. Wage data for 2005 is not yet available.



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Decade	Wages
1995-2004	4.1%
1985-1994	3.9
1975-1984	7.2
1965-1974	5.8
1955-1964	3.8

Period	Years	Wages
1995-2004	10	4.1%
1985-2004	20	4.0
1975-2004	30	5.1
1965-2004	40	5.3
1955-2004	50	5.0
1930-2004	75	4.7

The excess of wage growth over price inflation represents the increase in the standard of living, also called the real wage inflation rate. In general, real wage inflation had been decreasing until recently. The following table shows the compounded wage growth over various periods, along with the comparable inflation rate for the same period. The differences represent the real wage inflation rate. The data for each year is documented in Exhibit 3 at the end of this section.

Decade	Wage Growth	CPI Incr.	Real Wage Inflation
1995-2004	4.1%	2.4%	1.7%
1985-1994	3.9	3.6	0.3
1975-1984	7.2	7.3	(0.1)
1965-1974	5.8	5.2	0.6
1955-1964	3.8	1.6	2.2

Period	Wage Growth	CPI Incr.	Real Wage Inflation
1995-2004	4.1%	2.4%	1.7%
1985-2004	4.0	3.0	1.0
1975-2004	5.1	4.4	0.7
1965-2004	5.3	4.6	0.7
1955-2004	5.0	4.0	1.0
1930-2004	4.7	3.3	1.4

The excess of wage growth over price inflation represents the increase in the standard of living, also called productivity growth. There has been debate on the issue of whether public sector employees will receive, over the long term, the same rewards for productivity as employees in the private sector, where productivity is more readily measurable. To our knowledge, no definitive research has been completed on this topic. Nevertheless, it is our opinion that public sector employees must be rewarded, even if there is a time lag, with the same productivity increases as those participating in the remainder of the economy.

Forecasts of Future Wages: The wage index we used for the historical analysis has been projected forward by the Office of the Chief Actuary of the Social Security Administration. In a report in May of 2006, the annual increase in the National Average Wage Index over the next 30 years under the intermediate cost assumption was 3.9%, 1.1% higher than the Social Security intermediate inflation assumption of 2.80% per year. The range of the assumed real wage inflation in the 2006 Trustees report was 0.6% to 1.60% per year.



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Reasonable Range and Recommendation: Based on our judgment, we believe that a range between 0.50% and 1.50% is reasonable for the actuarial valuation. We recommend that the long-term assumed real wage inflation rate be increased to 0.75% per year.

Real Wage Inflation	
Current Assumption	0.50%
Reasonable Range	0.50% - 1.50%
Recommended Assumption	0.75%

Based on our inflation assumption of 3.25%, and the range for the real wage inflation rate of 0.50% to 1.50% a range between 3.75% and 4.75% is reasonable for the general wage growth assumption. We recommend the general wage assumption remain at 4.00%.

General Wage Growth	
Current Assumption	4.00%
Reasonable Range	3.75% - 4.75%
Recommended Assumption	4.00%

Due to our recommendation that the inflation assumption be lowered from 3.50% to 3.25%, the wage growth assumption would remain at 4.00% per year. Because it is unchanged, there will be no impact on active member liabilities.

Payroll Increase Assumption: In addition to setting salary assumptions for individual members, the aggregate payroll of IPERS is expected to increase, without accounting for the possibility of an increase in membership. See comments on growth in membership below.

A UAL (or Surplus) may be amortized as a percentage of payroll in determining future contribution rates as a percentage of pay. The payroll increase assumption is set equal to the wage growth assumption.

Payroll growth increases lower than expected have a negative effect on determining the UAL contribution rate, as a greater percentage of pay will be required to fund the UAL over a smaller expected payroll. Likewise, payroll growth increases greater than expected have a positive effect on determining the UAL contribution rate, as a lower percentage of pay will be required to fund the UAL over a larger expected payroll.

Growth in Active Membership: We propose continuing the assumption that no future growth in active membership will occur. This assumption affects the amortization payment rate, which is the portion of the total contributions used to liquidate the unfunded actuarial liability. With no assumed growth in active membership, future salary growth due only to general wage increases is being anticipated. If increases should occur not only because of wage increases but also because of additional active members, there will be a larger pool of salaries over which contributions would be paid which would result in a shorter amortization period.

Current conditions in public employment and the state of the national economy argue against anticipating any increase in membership for funding purposes. Furthermore, GASB Statement No. 25 will not accept a growth in membership assumption as meeting its required parameters for accounting disclosure purposes.



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Thus, if a membership growth assumption were to be used for funding purposes, a different set of calculations and results would be needed for accounting and disclosure purposes.



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Exhibit 1

U.S. Consumer Price Index

December of:	Index	Increase	December of:	Index	Increase
1928	17.1				
1929	17.2	0.6 %	1969	37.7	6.2%
1930	16.1	-6.4	1970	39.8	5.6
1931	14.6	-9.3	1971	41.1	3.3
1932	13.1	-10.3	1972	42.5	3.4
1933	13.2	0.8	1973	46.2	8.7
1934	13.4	1.5	1974	51.9	12.3
1935	13.8	3.0	1975	55.5	6.9
1936	14.0	1.4	1976	58.2	4.9
1937	14.4	2.9	1977	62.1	6.7
1938	14.0	-2.8	1978	67.7	9.0
1939	14.0	0.0	1979	76.7	13.3
1940	14.1	0.7	1980	86.3	12.5
1941	15.5	9.9	1981	94.0	8.9
1942	16.9	9.0	1982	97.6	3.8
1943	17.4	3.0	1983	101.3	3.8
1944	17.8	2.3	1984	105.3	3.9
1945	18.2	2.2	1985	109.3	3.8
1946	21.5	18.1	1986	110.5	1.1
1947	23.4	8.8	1987	115.4	4.4
1948	24.1	3.0	1988	120.5	4.4
1949	23.6	-2.1	1989	126.1	4.6
1950	25.0	5.9	1990	133.8	6.1
1951	26.5	6.0	1991	137.9	3.1
1952	26.7	0.8	1992	141.9	2.9
1953	26.9	0.7	1993	145.8	2.7
1954	26.7	-0.7	1994	149.7	2.7
1955	26.8	0.4	1995	153.5	2.5
1956	27.6	3.0	1996	158.6	3.3
1957	28.4	2.9	1997	161.3	1.7
1958	28.9	1.8	1998	163.9	1.6
1959	29.4	1.7	1999	168.3	2.7
1960	29.8	1.4	2000	174.0	3.4
1961	30.0	0.7	2001	176.7	1.6
1962	30.4	1.3	2002	180.9	2.4
1963	30.9	1.6	2003	184.3	1.9
1964	31.2	1.0	2004	190.3	3.3
1965	31.8	1.9	2005	196.8	3.4
1966	32.9	3.5			
1967	33.9	3.0			
1968	35.5	4.7			



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Exhibit 2

National Average Wage Index

	Index	Increase		Index	Increase
1927	\$1,159.14				
1928	1,162.53	0.3%	1968	\$5,571.76	6.9%
1929	1,196.88	3.0	1969	5,893.76	5.8
1930	1,164.95	(2.7)	1970	6,186.24	5.0
1931	1,086.09	(6.8)	1971	6,497.08	5.0
1932	954.02	(12.2)	1972	7,133.80	9.8
1933	892.58	(6.4)	1973	7,580.16	6.3
1934	929.34	4.1	1974	8,030.76	5.9
1935	968.53	4.2	1975	8,630.92	7.5
1936	1,008.20	4.1	1976	9,226.48	6.9
1937	1,071.58	6.3	1977	9,779.44	6.0
1938	1,047.39	(2.3)	1978	10,556.03	7.9
1939	1,076.41	2.8	1979	11,479.46	8.7
1940	1,106.41	2.8	1980	12,513.46	9.0
1941	1,228.81	11.1	1981	13,773.10	10.1
1942	1,455.70	18.5	1982	14,531.34	5.5
1943	1,661.79	14.2	1983	15,239.24	4.9
1944	1,796.28	8.1	1984	16,135.07	5.9
1945	1,865.46	3.9	1985	16,822.51	4.3
1946	2,009.14	7.7	1986	17,321.82	3.0
1947	2,205.08	9.8	1987	18,426.51	6.4
1948	2,370.53	7.5	1988	19,334.04	4.9
1949	2,430.52	2.5	1989	20,099.55	4.0
1950	2,570.33	5.8	1990	21,027.98	4.6
1951	2,799.16	8.9	1991	21,811.60	3.7
1952	2,973.32	6.2	1992	22,935.42	5.2
1953	3,139.44	5.6	1993	23,132.67	0.9
1954	3,155.64	0.5	1994	23,753.53	2.7
1955	3,301.44	4.6	1995	24,705.66	4.0
1956	3,532.36	7.0	1996	25,913.90	4.9
1957	3,641.72	3.1	1997	27,426.00	5.8
1958	3,673.80	0.9	1998	28,861.44	5.2
1959	3,855.80	5.0	1999	30,469.84	5.6
1960	4,007.12	3.9	2000	32,154.82	5.5
1961	4,086.76	2.0	2001	32,921.92	2.4
1962	4,291.40	5.0	2002	33,252.09	1.0
1963	4,396.64	2.5	2003	34,064.95	2.4
1964	4,576.32	4.1	2004	35,648.55	4.6
1965	4,658.72	1.8			
1966	4,938.36	6.0			
1967	5,213.44	5.6			



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Exhibit 3

Annual Rates of Price and Wage Inflation

Plan Year Ends	National Wage Index	National Price CPI Index	National Implied Productivity Increase
1985	4.3%	3.8%	0.5%
1986	3.0%	1.1%	1.8%
1987	6.4%	4.4%	2.0%
1988	4.9%	4.4%	0.5%
1989	4.0%	4.6%	-0.7%
1990	4.6%	6.1%	-1.5%
1991	3.7%	3.1%	0.7%
1992	5.2%	2.9%	2.3%
1993	0.9%	2.7%	-1.9%
1994	2.7%	2.7%	0.0%
1995	4.0%	2.5%	1.5%
1996	4.0%	3.3%	1.6%
1997	5.8%	1.7%	4.1%
1998	5.2%	1.6%	3.6%
1999	5.6%	2.7%	2.9%
2000	5.5%	3.4%	2.1%
2001	2.4%	1.5%	0.8%
2002	1.0%	2.4%	-1.4%
2003	2.4%	1.9%	0.6%
2004	4.6%	3.3%	1.4%

Geometric Averages

5-year period

1985 - 1989	4.5%	3.7%	0.8%
1990 - 1994	3.4%	3.5%	-0.1%
1995 - 1999	5.1%	2.4%	2.7%
2000 - 2004	3.2%	2.5%	0.7%

10-year period

1985 - 1994	3.9%	3.6%	0.4%
1995 - 2004	4.1%	2.4%	1.7%

15-year period

1990 - 2004	3.9%	2.8%	1.1%
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*Based on Average Annual Pay



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Section 5

Introduction to Demographic Assumptions

Actuarial Standard of Practice (ASOP) No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries giving advice on selecting demographic assumptions for defined benefit plans, such as IPERS.

The purpose of a study of demographic experience is to compare what actually happened to the individual members of the System during the study period (June 30, 2001, through June 30, 2005) with what was expected to happen based on the actuarial assumptions. Four years is a relatively short observation period, so we have considered experience in the previous observation period (1998 - 2001) when practical to do so. Where A/E ratios from prior experience studies are shown, the expected decrements are based on the current assumptions. Therefore, the A/E ratios shown in this report may not match the A/E ratios shown in the prior Experience Study report.

Studies of demographic experience generally involve three steps:

- First, the number of members changing membership status, called decrements, during the study is tabulated by age, duration, sex, group, and membership class (active, retired, etc.).
- Next, the number of members expected to change status is calculated by multiplying certain membership statistics, called exposure, by the expected rates of decrement.
- Finally, the number of actual decrements is compared with the number of expected decrements. The comparison is called the actual to expected ratio (A/E Ratio), and is expressed as a percentage.

In general, if the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, sex, or duration deviates significantly from the expected pattern, new assumptions are considered. Recommended revisions are normally not an exact representation of the experience during the observation period. Judgment is required to predict future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience.

We are introducing a new methodology for analyzing the experience, i.e. a “liability weighted” approach. The member’s “liability” in the System is generally determined by the benefit amount and age of the member. Most assumptions already reflected differences by age directly. The other factor, benefit amount, is impacted by salary and service. We use these two factors to estimate the member’s relative benefit level and use it to weight experience (the exposure and actual occurrences are scaled by salary and service). This approach is particularly insightful when analyzing experience from a non-homogenous group. While we reviewed experience on both a count and liability basis for most decrements, when there was a significant difference between the two, we generally believe the liability weighted experience is more credible. As subsequent studies are performed using the new methodology, we will be in a better position to evaluate experience and make recommended changes.

When changes in assumptions are recommended, revised rates of decrement are tested by using them to recalculate the expected number of decrements during the study period, and the results are shown as revised A/E Ratios.



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Salary adjustments, other than the economic assumption for wage inflation, are treated as demographic assumptions. However, the method of investigation needed for salaries is different from that used for the decrements.

It takes a fair amount of data to perform a credible study of demographic assumptions. Because the benefit provisions are similar and membership of the Special Services groups is relatively small, experience for the two Special Services groups has been aggregated. In addition, some assumptions have been selected based more on our professional judgement of reasonable future outcomes than actual experience.

The demographic assumptions studied for both Regular and Special Services groups include:

- Mortality
- Retirement
- Disability
- Termination of Employment
- Probability of Electing a Vested benefit
- Merit Salary Scale



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Section 6

Mortality

One of the most important demographic assumptions is mortality because this assumption predicts when retirement payments will stop. It also predicts when pre-retirement death benefits will be paid. The life expectancies of current and future retirees are predicated on the assumed rates of mortality at each age. It is commonly known that rates of mortality declined throughout the 20th century and continue to decline, which means people, in general, are living longer. Furthermore, the experience of large, public retirement systems that cover School employees indicate that the School group continues to exhibit better mortality than the average working group.

Because of potential differences in mortality, we studied healthy retirees, disabled retirees and active members separately.

Healthy Retirees: The valuation currently uses separate mortality assumptions for male and female members. The mortality assumption for healthy retirees was changed in the last experience study to the RP-2000 Generational Table for Healthy Annuitants (RP-2000), with the following adjustments:

Males	One Year Set Forward
Females	Two Years Set Back

If the A/E Ratio is greater than 100% the assumptions have predicted fewer deaths than actually occurred, and with an A/E Ratio less than 100% the assumptions have predicted more deaths than have occurred. Because future improvements in mortality are explicitly reflected in the mortality rates applied in future years, there is no need for a “margin” (A/E above 100%).

Over the prior two experience studies, the mortality assumption was strengthened two times. In the last experience study a new mortality table, known as the RP-2000 Table was adopted. The table projects anticipated future mortality improvements on a “generational” basis, i.e. mortality rates are set by the year in which a member reaches a particular age, which is a more sophisticated approach to incorporating expected mortality improvements in the future.

The RP-2000 Table uses a projection scale to model improvements in mortality in each future year. Since the study period covered the period June 30, 2001 to June 30, 2005, we projected mortality rates to 2003 for purposes of developing the expected number of deaths at each age.

Healthy Retirees	2001-2005 Observations		A/E Ratio		
	Actual	Expected	2001-2005	1998-2001	1998-2005
Male	3,601	3,972	91%	97%	93%
Female	3,919	4,087	96%	99%	97%
Totals	7,520	8,059	93%	98%	95%



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The A/E ratio for males and females in the current study was 91% and 96% respectively, compared to ratios of 97% and 99% in the prior study. When the two periods are aggregated the A/E ratios are 93% and 97%. The observed experience for males in the current study period is troublesome as the A/E ratio dropped 6% over a four year period. Changes in mortality generally unfold gradually over a long period of time. When experience was studied by group it became apparent which experience was driving the low A/E ratio for males. Mortality experience was similar to that observed last time for all groups but State Males where the A/E ratio dropped from 106% to 90%. Our sense is that the observed experience in either the current study or the prior study is questionable or an anomaly, but which period cannot be determined. Given the change to the current assumption was recently implemented and the uncertainty surrounding the observed results in this period, we prefer to leave the mortality assumption unchanged and closely monitor future experience to determine what change, if any is appropriate.

In the last experience study, we first began to study experience by employer group (School, State, and Local). We continue that analysis in this study in an attempt to determine if significant differences exist between groups. The results are shown below:

Healthy Retirees	2001-2005 Observations		A/E Ratio		
	Actual	Expected	2001-2005	1998-2001	1998-2005
Male					
School	1,411	1,705	83%	86%	84%
State	705	784	90%	106%	96%
All Others	<u>1,485</u>	<u>1,483</u>	100%	100%	100%
Total	3,601	3,972	91%	93%	92%
Female					
School	1,909	2,217	86%	90%	88%
State	627	578	109%	107%	108%
All Others	<u>1,383</u>	<u>1,292</u>	107%	106%	107%
Total	3,919	4,087	96%	97%	97%

As we identified in the last study, School employees have the “best” mortality rates (i.e. longer life expectancy) of the three employer groups. We find this to be true in most of the public retirement systems for whom we provide services, i.e. School employees typically exhibit lower mortality rates than other members. From a purely actuarial perspective, a separate assumption for School and Non-School appears reasonable. However, the use of different assumptions by employer group would be a dramatic change for IPERS. We feel the topic deserves significant discussion with the staff and Board before a decision is made. We will be addressing this with the Board at the June meeting. This fact, coupled with the discussion above regarding uncertainty about the study results, leads us to recommend further study and discussion to occur before a decision is made.

Beneficiaries: The mortality of beneficiaries applies to the survivors of members who have elected a joint and survivor option. There is never complete data on the mortality experience of beneficiaries prior to the death of the member because there is no requirement that the death be reported to the System (unless they elected Option 6, Joint & Survivor with pop-up). Therefore, we recommend we continue to follow standard convention and set the mortality of beneficiaries equal to the mortality of retired members.



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Disabled Members: The valuation assumes that disabled members, in general, will not live as long as retired members who met the regular service retirement eligibility. There tends to be more fluctuation in disabled mortality than healthy mortality because of differences in the types of disabilities and the relatively small number of lives. In addition the smaller number of exposure makes the results more volatile. The current assumption is 2.50% plus the corresponding non-disabled rate, based on the 1994 Group Annuity Mortality Table (100% for males and 95% for females), but not less than 3.00%. Based on this assumption, the A/E Ratios for males and females were 124% and 93% respectively. This assumption was first implemented with the last experience study and the results appear reasonable at this time. Therefore, we recommend the current assumption be retained.

Active Members: This assumption predicts eligibility for death benefits for active members prior to retirement, rather than the expected lifetime for pension payments. For active member mortality, it is more conservative to have an A/E Ratio less than 100% because active member death benefits are generally less costly than retirement benefits.

The current assumption is the RP-2000 Employee Table with the same adjustments for males and females as for retired lives. Rates of mortality among active members may be impacted by active members first terminating or moving to disabled status before death. In addition, the number of deaths from active membership may be understated because the criteria for reporting for purposes of this study requires that a members' date of death and payment date occur before June 30. For these reasons, it is likely active death rates are higher than the experience data might indicate.

The observed A/E Ratios for active members are shown in the following chart.

Active Deaths	Actual	Expected	A/E Ratio
Current Assumption			
Male	234	317	74%
Female	250	605	41%
Totals	484	922	52%

We recommend the current assumption be retained.

Special Services Members

For Special Services members, we studied healthy retired and active mortality experience. There was an insufficient number of female members to produce statistically reliable information. Therefore, our analysis was performed for male members only. While there is more data for males, the number of members is much smaller than the regular membership. Therefore, less credibility is assigned to the results.

The current assumption for this group for healthy retirees is the RP-2000 Healthy Annuitant Table with a three year age set forward for males and no age adjustment for females. For actives, the RP-2000 Employee Table with the same age adjustments is used. It is assumed that 5% of pre-retirement deaths are service related.



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The results of this study, along with the 2001 Experience Study, are shown below.

Deaths	2001-2005 Observations		A/E Ratios		
	Actual	Expected	2001-2005	1998-2001	1998-2005
Current Assumption					
Healthy Retirees	40	44	91%	118%	103%
Actives	27	28	96%	45%	78%

Based on the results of the experience study, we recommend the current assumption be retained.



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Section 7

Retirement

Service retirement measures the change in status from active membership directly to retirement. This assumption does not include the retirement patterns of the retirees who terminated from active membership months or years prior to their retirement. That experience is studied separately.

The requirement for early retirement with a reduced benefit is age 55. The requirements for retirement with a full (unreduced) benefit are age 65 or age 62 with 20 years of service (referred to as "normal retirement"). Full, unreduced benefits are also available at or after age 55 if age plus service is at least equal to 88 (referred to as Rule of 88).

Among the members at any age who are eligible to retire with unreduced benefits (Rule of 88 or normal retirement), those who are in their first year of meeting the eligibility requirements are generally more likely to retire than those who met that requirement more than a year ago. We refer to retirement rates for those in their first year of such eligibility as "select" and those beyond that first year as "ultimate." This select/ultimate approach is the basis for evaluation of experience.

The summary results of our experience study, using counts, are shown below:

Retirement	Actual	Expected	A/E Ratios		
			2001-2005	1998-2001	1998-2005
Early	6,285	7,555	83%	89%	85%
Select	2,327	2,523	92%	75%	86%
Ultimate	5,960	7,116	84%	77%	81%
Total	14,572	17,194	85%	82%	84%

Based on this data, there was a smaller number of retirements during the study period than expected. However, in the June 30, 2004 and 2005 valuations, our experience gain/loss analysis indicated an experience loss on retirements despite the fact that a smaller number of members retired than expected. This occurred because the demographic composition of the group retiring was significantly different than that of the total eligible group. In general, the average salary and service for those retiring was higher than the average salary and service for the group eligible to retire. Our new methodology of liability weighted analysis captures these differences in the experience results and confirms the experience observed from year to year in the valuation. The members who retired during the study period had higher benefits than the average group. Given the economic and political period in which the study occurred, it may be that the observed experience is not representative of future experience.



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A/E Ratio		
Retirement	Count	Weighted
Early	83%	124%
Select	92%	118%
Ultimate	84%	109%
Total	85%	115%

The A/E ratios based on count would argue that actual retirements are lower than expected using the current actuarial assumptions and assumptions should be lowered, particularly for Early and Ultimate retirement. However, when experience is analyzed factoring in the liability of members, the current retirement rates appear too low.

There is a high probability that retirement rates, especially the utilization of the Rule of 88, will vary among employer groups. Part of the higher utilization by School employees is often the result of ongoing early retirement incentive programs offered by local School Districts. In the last experience study, we separately studied experience for State, School and All Other Employers. We continued the separate analysis in this study. Our findings, based on count, are summarized below.

2001-05 Observations			A/E Ratio		
Early	Actual	Expected	2001-2005	1998-2001	1998-2005
School	3,620	3,741	97%	94%	96%
State	830	1,053	79%	90%	83%
All Others	1,835	2,761	66%	81%	72%
Total	6,285	7,555	83%	89%	85%

2001-05 Observations			A/E Ratio		
Select	Actual	Expected	2001-2005	1998-2001	1998-2005
School	1,415	1,419	100%	74%	90%
State	325	362	90%	80%	86%
All Others	587	743	79%	70%	75%
Total	2,327	2,524	92%	73%	85%



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2001-05 Observations			A/E Ratio		
Ultimate	Actual	Expected	2001-2005	1998-2001	1998-2005
Current Assumption					
School	831	952	87%	75%	82%
State	3,484	3,866	90%	82%	87%
All Others	1,645	2,298	72%	70%	71%
Total	5,960	7,116	84%	77%	81%

Analysis, by group, on a liability weighted approach is summarized below:

Early	A/E Ratios (2001-2005)	
	Count	Weighted
School	97%	160%
State	79%	96%
All Others	66%	89%
Total	83%	124%

Select	A/E Ratios (2001-2005)	
	Count	Weighted
School	100%	134%
State	90%	92%
All Others	79%	96%
Total	92%	118%

Ultimate	A/E Ratios (2001-2005)	
	Count	Weighted
School	87%	122%
State	90%	96%
All Others	72%	89%
Total	84%	109%



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The concept of analyzing the data on a “liability basis” versus “count basis” is a new development in this study and, therefore, experience is only available for this four year study period. The A/E ratios on a count versus liability basis would lead the changes in the opposite direction. For these reasons we recommend maintaining the current assumptions and re-evaluating the appropriate changes in the next experience study when more data on the liability-weighted approach is available. We also recommend deferring a decision on the use of different assumptions by group until the next study.

Inactive Vested Members

Currently, inactive vested members who leave their contributions with the System are assumed to retire at age 62. We reviewed the experience during the observation period and found that age 61 was the average retirement age. Given other retirement experience during the period and our sense that the experience is not representative of future experience we recommend the current assumption of age 62 be retained for inactive vested members.

Special Services Groups

The eligibility requirement for retirement benefits is different for the Special Services groups and, therefore, a different assumption is used in valuing the liabilities for these groups. During the last year of the study, the eligibility changed for the Special Services Group 1 as well. The results of our investigation of experience during this study period are shown below.

Retirement	Actual	Expected	A/E Ratio
Count Basis	346	669	52%
Liability Basis	N/A	N/A	95%

Much like the experience for the regular membership, the analysis on a liability weighted basis indicates the assumption is a reasonable fit to actual experience. We would like to have additional data on the liability weighted basis before any change is considered. Coupled with the new eligibility provisions for Special Services Group 1, we recommend the retirement rates for both Special Services groups remain unchanged at this time.



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Section 8

Disability

The current disability assumption for the regular membership was first introduced in the 1998 Experience Study. Separate disability rates are developed for males and females. The table below indicates the number of actual and expected disabilities during the study period and the resulting A/E Ratios. In general, ratios below 100% indicate fewer disabilities than expected which would decrease the actuarial liabilities.

Disabilities	Actual	Expected	A/E Ratio	
			2001-2005	1998-2001
Males	197	303	65%	90%
Females	350	353	99%	98%
Total	547	656	83%	94%

Because of the time lag involved in reporting and processing disabilities, it is very likely many of the members who became disabled in the last year of the study period were not reported by the time the valuation data was provided (see chart below) so that year was eliminated from the data. The data below supports this decision.

Disabilities	Male			Female		
	Actual	Expected	A/E Ratio	Actual	Expected	A/E Ratio
Year 1	73	100	73%	150	114	132%
Year 2	64	99	65%	109	116	94%
Year 3	60	104	58%	91	123	74%
Year 4	35	108	32%	48	130	37%
Total	232	411	56%	398	483	82%

Based on the experience in this and the prior Experience Study and the expected volatility of results, we recommend the current assumption be maintained.

Special Services

During the study period, there were 38 disabilities compared to 400 expected, resulting in an A/E ratio of 10%. Due to the small number of exposure for female members in these groups, one set of rates is used for all members. Furthermore due to the small size of the group (as compared to the regular membership) actual experience, although considered, cannot be given full credibility. However, we do recommend reducing the rates to half of what they currently are.



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Section 9

**Termination of Employment
(Withdrawal)**

This section of the report summarizes the results of our study of terminations of employment for reasons other than death, retirement, or disability. Rates of termination can vary by both age and years of service and gender. In general rates of termination are highest at younger ages and in the early years of employment.

The following table shows that over 40% of all terminations occur for members within their first year of membership and about 80% occur in the first six years of membership.

Withdrawal by Membership Year				
Membership Class	Less Than 2 Years	2nd – 6th Year	7th & Higher Year	All Years
Male	5,066	4,077	1,984	11,127
Female	<u>12,292</u>	<u>11,157</u>	<u>5,063</u>	<u>28,512</u>
Total	17,892	15,234	7,047	39,639

The number of withdrawals includes all members reported to have terminated employment. Some of these members subsequently receive refunds of contributions; some return to active membership and some leave their contributions with the System until retirement. This is addressed in the use of explicit assumptions about what happens to the members after they terminate employment.

The following chart shows the actual and expected number of terminations for causes other than death, retirement, or disablement, and the corresponding A/E Ratios. In general, terminations lower than expected increase the liabilities but in terms of the impact on the valuation, which members terminate can be more important than the number of terminations. Overall, the assumptions predicted the number of actual terminations fairly accurately with an overall A/E Ratio for males of 96% and 93% for females. The specific results are summarized on the table on the following page.



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Terminations	Actual	Expected	A/E Ratio	
			2001-2005	1998-2001
Males				
Year 0-1	5,066	4,880	104%	96%
Year 2	1,455	1,550	94%	92%
Year 3	994	1,131	88%	95%
Year 4-6	1,628	1,805	90%	98%
Year 7-8	521	569	92%	95%
Year 9+	<u>1,463</u>	<u>1,670</u>	88%	98%
Total	11,127	11,605	96%	94%
Females				
Year 0-1	12,292	12,664	97%	92%
Year 2	4,074	4,297	95%	91%
Year 3	2,605	2,937	89%	92%
Year 4-6	4,478	5,257	85%	92%
Year 7-8	1,485	1,592	93%	107%
Year 9+	<u>3,578</u>	<u>3,909</u>	92%	97%
Total	28,512	30,656	93%	90%
Total Male and Female	39,639	42,261	94%	91%

We also analyzed the experience on a liability weighted basis with the following results:

Terminations	A/E Ratio	
	Count	Weighted
Males		
Year 0-1	104%	65%
Year 2	94%	73%
Year 3	88%	67%
Year 4-6	90%	70%
Year 7-8	92%	72%
Year 9+	88%	64%
Total	96%	67%
Females		
Year 0-1	97%	68%
Year 2	95%	76%
Year 3	89%	71%
Year 4-6	85%	65%
Year 7-8	93%	72%
Year 9+	92%	58%
Total	93%	62%



**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

Overall, the number of terminations for males were close to expected and for females were slightly lower than expected. A/E ratios were generally lower than observed in the last study. Given the timeframe covered in the study period (post 9/11), the lower rates of termination seem reasonable. The liability weighted experience indicates that current rates might be significantly overstated. However, we only have one study period to base this analysis on and, as stated earlier, we believe this is not a typical period. Therefore, we recommend further study before any change is made.

In the prior study, we first analyzed experience to see if significant differences might exist by employer group. We again performed this supplemental analysis. Our results, based on the current assumptions, are shown below:

Terminations	A/E Ratios					
	State		School		All Others	
	2001-2001	1998-2001	2001-2005	1998-2001	2001-2005	1998-2001
Males						
Year 0-1	133%	86%	103%	192%	95%	166%
Year 2	105%	81%	96%	84%	88%	75%
Year 3	92%	105%	88%	96%	87%	91%
Year 4-6	74%	81%	95%	105%	92%	95%
Year 7-8	73%	79%	89%	91%	102%	103%
Year 9+	71%	93%	86%	86%	97%	184%
Females						
Year 0-1	116%	104%	92%	89%	98%	90%
Year 2	107%	74%	67%	76%	82%	83%
Year 3	77%	72%	67%	73%	80%	92%
Year 4-6	74%	86%	81%	84%	95%	110%
Year 7-8	75%	92%	87%	93%	113%	134%
Year 9+	84%	77%	80%	82%	120%	141%

There do appear to be material differences in rates of termination of employment by employer group at most service durations. However, given the new approach with liability weighted analysis and the significant differences that exist, we are uncomfortable making any change at this time. Furthermore, we would like to have a discussion with the Board about the use of separate assumptions for each group.

Special Services Groups

Due to the small number of female members in the Special Service groups there is insufficient data upon which to develop separate assumptions by gender. We have developed one set of age based assumptions to be used for all special service members. The results of our study are shown below:

Terminations	Actual	Expected	A/E Ratio
Count	1,310	940	139%
Weighted	N/A	N/A	66%



IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Although the observed A/E Ratio of 139% on a count basis indicates the current assumption is too high, the experience on a liability weighted basis indicates the opposite, i.e. rates should be lowered. Given the significant difference in results, on a count and liability basis, we recommend the current assumption be retained and the results be monitored in the next experience study.



IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Section 10

Refund/Probability of Electing a Vested benefit

Many members who terminate active employment elect to receive a distribution of their member account balance and the appropriate share of their employer balance. We assume that all non-vested members receive a refund of their account balance at the time of termination. In addition, we assume that a certain number of active vested members who terminate also elect a refund, thus forfeiting a vested right to their employer-provided benefit.

Typically, there is a potential “lag” from a member’s date of termination of employment to the date he requests and receives his refund. Prior analysis indicated that about 75% of refunds occur within two years of termination. Due to the fact that many of the members who terminated in the last year of the Experience Study period may not have requested or completed their refund, so the last year of data is excluded in our analysis.

Regular Membership

This assumption was changed from an age based to a service based assumption in the last Experience Study. As a result, rates were set close to actual observed experience. Therefore, we would expect to make adjustments as additional experience unfolds.

The following table shows the number of vested members who terminated and elected to leave their funds with the System and receive a vested benefit, along with the expected count based on the current and revised assumptions.

Electing a Vested Benefit	Actual	Expected	A/E Ratio	
			Count	Weighted
Current Assumption				
Male	2,295	2,026	113%	107%
Female	<u>6,248</u>	<u>5,095</u>	108%	102%
Total	8,543	7,835	109%	104%



IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Again we studied this experience by employer group to see if differences exist. Our results, are shown below:

2001-2005 Observations			A/E Ratio	
Vested Benefit	Actual	Expected	2001-2005	1998-2001
Male				
State	229	244	94%	94%
School	643	592	109%	109%
All Others	<u>695</u>	<u>710</u>	98%	98%
Total	1,567	1,546	101%	101%
Female				
State	424	482	88%	88%
School	2,243	2,098	107%	107%
All Others	<u>1,532</u>	<u>1,650</u>	93%	93%
Total	4,199	4,230	99%	99%

School employees have the lowest incidence of taking refunds, and therefore the highest incidence of leaving contributions with the System. This seems reasonable as it is common for women, in particular, to leave their teaching position for several years to have and raise children. The differences in the State and Other Employers' experience is less dramatic.

As with other assumptions, this is the first experience we have performed analysis on a liability as well as count basis. We recommend this analysis continue in the next experience study and the current assumption be retained.

Special Services

Because the group is small and termination rates are low, there is little credible data upon which to base this assumption. The revised A/E Ratio based on the current assumption was 98% for males and 74% for females. Comparable numbers on a liability weighted basis were 90% and 70% for males and females. We recommend the current rates be retained. Although we considered actual experience, the final rates were based on professional judgment.



Section 11
Merit Salary Scale

Estimates of future salaries are based on assumptions for two types of increases:

1. Increases in each individual's salary due to promotion or longevity (often called merit scale), and
2. Increases in the general wage level of the membership, which are directly related to price and wage inflation.

Earlier in this report, we recommended that the second of these rates, general wage inflation remain at 4.0% (3.25% price inflation and 0.75% real wage inflation).

Although future salary increases are the result of two components, it is difficult to isolate the true salary adjustment due to inflation and productivity given the number of different employers in IPERS and potential varying conditions for each employer. Therefore, the experience study reviewed total salary increases for the period. We then eliminated the percentage attributable to general wage growth to try and isolate the merit scale. The general wage growth for the period was determined by reviewing actual salary increases by duration (years of service). For those members with more than 30 years of service, it was assumed no merit scale applied and all of the salary increase was attributable to increases in the general wage level. The results indicated a general wage increase during the study period of 4.3%, very close to the 4.0% assumed rate. If the general wage assumption is subtracted from the total salary scale, the result is the merit scale.

Price inflation during the study period (2001-2005) was 2.2% as compared to our assumption of 3.5%, so we would have expected to see lower actual wage increases during this period than the assumed rates. However, there also is very likely a lag between the occurrence of actual inflation and the time the wage increase is granted based on that experience. Thus, at any point in time, general salary increases are more likely to be impacted by the actual inflation in the past several years as compared to the current year. Inflation for the period 1995 to 2005 was 2.5% and the change in the National Average Wage was 4.1% during this period. Although inflation was about 1.0% lower than our assumption, real wage growth was about 1.0% higher than our assumption. The net impact was that general wage growth in the national economy was very close to the current assumption. While experience did show actual salary increases below that expected based on the assumption, the difference was less than 1% for most durations.



IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

We compared individual salary increases for all members active in any two consecutive years (e.g. 2001 and 2002, 2002 and 2003, etc.). The overall results by year of service of the four years studied are shown below:

Years of Service	Average Increase in Salaries		
	2001-2005		
	Actual	Expected	Difference
≤ 1	15.6%	15.2%	0.4%
2	7.9%	9.6%	(1.7%)
3	6.5%	7.9%	(1.4%)
4-5	6.0%	7.0%	(1.0%)
6-7	5.6%	6.3%	(0.7%)
8-10	5.1%	5.8%	(0.7%)
11-15	4.7%	5.2%	(0.5%)
16-20	4.2%	4.7%	(0.5%)
21+	4.0%	4.2%	(0.2%)

Since salary experience is closely tied to the economy; a longer study period is needed before any dramatic changes are considered. The actual experience for the last three studies is summarized below:

Years of Service	Average Increase in Salaries				
	2001-2005	Actual		Average	Expected
		1998-2001	1993-1998		
≤ 1	15.6%	17.1%	14.3%	15.6%	15.2%
2	7.9%	8.4%	8.9%	8.4%	9.6%
3	6.5%	7.5%	7.2%	7.1%	7.9%
4-5	6.0%	6.9%	6.5%	6.5%	7.0%
6-7	5.6%	6.2%	5.6%	5.8%	6.3%
8-10	5.1%	5.6%	5.2%	5.3%	5.8%
11-15	4.7%	5.0%	4.7%	4.8%	5.2%
16-20	4.2%	4.4%	4.2%	4.3%	4.7%
21+	4.0%	4.1%	3.6%	3.9%	4.2%

As with the other demographic assumptions we studied salary experience during the investigative period by group and found the following:

Years of Service	State		School		All Others	
	2001-2005	1998-2001	2001-2005	1998-2001	2001-2005	1998-2001
≤ 1	11.1%	18.2%	19.4%	16.1%	14.6%	18.6%
2	7.9%	8.8%	8.3%	8.6%	7.6%	8.7%
3	8.8%	8.8%	6.5%	7.2%	6.3%	7.8%
4-5	7.3%	7.9%	6.0%	6.8%	5.7%	7.0%
6-7	5.4%	7.1%	5.6%	6.2%	5.1%	6.1%
8-10	6.2%	6.0%	5.2%	5.5%	4.9%	5.8%
11-15	5.5%	5.4%	4.5%	4.8%	4.6%	5.7%
16-20	4.8%	5.1%	4.0%	4.1%	4.0%	5.3%
21+	4.8%	4.9%	3.8%	3.6%	3.8%	5.0%



IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

There are some differences in the salary increases experienced by members of different employer groups, in particular the School group. We recommend this analysis be carried over to the next experience study and the aggregate experience of the two studies be considered at that time to determine whether separate salary increase assumptions by group are appropriate. As mentioned earlier, we would like to discuss the use of separate assumptions by group with the Board before any recommendation is made.

The current assumption for merit scale varies by both age and service. Based on observed data in the last two studies, there is little variance by age. In order to simplify the assumption, we recommend a pure service based assumption be implemented using the smoothed experience of the combined experience of the current and prior study. We do not expect this change to have a dramatic impact on System liabilities.

Special Services Groups

Separate analysis was done for the Special Services groups. Actual salary increases, by service, are very close to those observed in the regular membership. Therefore we recommend the salary increase assumptions for the regular membership also be used for the Special Service groups.



APPENDICES



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APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS



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**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS

ECONOMIC ASSUMPTIONS:

Rate of Inflation (effective June 30, 1999)

3.50% per annum

Rate of Crediting Interest on Contribution Balances (effective June 30, 2002)

4.25% per annum, compounded annually

Rate of Investment Return (effective June 30, 1996)

7.50% per annum, compounded annually, net of expenses.

Wage Growth Assumption (effective June 30, 1999)

4.00% per annum, based on 3.50% inflation assumption and 0.50% real wage inflation.

Payroll Increase Assumption (effective June 30, 1999)

4.00% per year

DEMOGRAPHIC ASSUMPTIONS:

Rates of Mortality (effective June 30, 2002)

		<u>Regular Membership</u>	<u>Special Services</u>
Males:	Retires:	RP-2000 Healthy Annuitant Table, Set Forward One Year	RP-2000 Healthy Annuitant Table Set Forward Three Years
	Actives:	RP-2000 Employee Table, Set Forward One Year	RP-2000 Employee Table Set Forward Three Years
Females:	Retires:	RP-2000 Healthy Annuitant Table, Set Back Two Years	RP-2000 Healthy Annuitant Table No Age Adjustment
	Actives:	RP-2000 Employee Table, Set Back Two Years	RP-2000 Employee Table No Age Adjustment
	The RP-2000 Tables are used with generational mortality		
Beneficiaries:	Same as members		Same as members
Disabled Members:	Annual rates are the greater of 3% or 2.5% plus the corresponding non-disabled rate (based on GAM 94 for males, 95% of GAM 94 for females)		Same as healthy members set forward 6 years

For Special Services active members, 5% of deaths are assumed to be service related.



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**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

Retirement Rates (effective June 30, 2002)

Upon meeting the requirements for early retirement, the following rates apply to regular members:

<u>Age</u>	<u>Assumed Retirement Rate</u>
55-59	5%
60	10
61	15
62	25
63-64	20

Upon reaching the requirements for normal retirement, the following rates apply:

<u>Age</u>	<u>Assumed Retirement Rates</u>		
	<u>1st Year Eligible</u>	<u>After 1st Year</u>	<u>Special Services</u>
55	20%	10%	15%
56	20%	10%	10%
57-59	20%	20%	10%
60	25%	25%	10%
61	35%	30%	20%
62	50%	40%	35%
63	35%	30%	20%
64	35%	35%	35%
65	30%	45%	100%
66	20%	20%	100%
67-68	15%	15%	100%
69	15%	35%	100%
70+	100%	100%	100%

Special Services Group 1 ages 50 to 55 with 22 years of service: 30%

Terminated vested members are assumed to retire at age 62 (55 for Special Services).

For regular membership, retired re-employed members are assumed to retire at a rate of 25% per year until age 80 when all are assumed to retire.

Rates of Disablement (effective June 30, 1999)

<u>Age</u>	<u>Annual Rate Per 1,000 Members</u>		
	<u>Males</u>	<u>Females</u>	<u>Special Services</u>
27	0.2	0.2	2.3
32	0.2	0.2	2.3
37	0.4	0.3	3.7
42	0.7	0.5	7.0
47	1.4	0.9	13.0
52	3.3	2.2	29.3
57	6.3	3.9	52.0
62	9.0	6.2	97.5



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**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

Rates of Termination of Employment (effective June 30, 2002)

Regular Membership

		Annual Rate of Withdrawals Per 1,000 Members					
<u>Males:</u>							
	<u>Age</u>	<u>Years 0-1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-6</u>	<u>Years 7-8</u>	<u>Years 9+</u>
	22	330.0	250.0	165.0	165.0	110.0	66.0
	27	231.0	145.0	121.0	99.0	88.0	66.0
	32	198.0	145.0	110.0	74.8	55.0	38.5
	37	195.8	140.0	110.0	74.8	49.5	33.0
	42	195.8	140.0	110.0	74.8	49.5	25.3
	47	195.8	130.0	99.0	74.8	49.5	19.8
	52	176.0	110.0	77.0	74.8	49.5	19.8
	55+	165.0	110.0	55.0	74.8	49.5	19.8
<u>Females:</u>							
	<u>Age</u>	<u>Years 0-1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-6</u>	<u>Years 7-8</u>	<u>Years 9+</u>
	22	330.0	250.0	220.0	220.0	165.0	55.0
	27	275.0	170.0	140.0	110.0	99.0	55.0
	32	247.5	170.0	140.0	104.5	71.5	49.5
	37	198.0	150.0	110.0	104.5	66.0	36.3
	42	198.0	150.0	110.0	88.0	60.5	30.8
	47	198.0	130.0	110.0	82.5	49.5	25.3
	52	198.0	130.0	110.0	82.5	49.5	25.3
	55+	198.0	130.0	110.0	82.5	49.5	25.3

Special Services

Annual Rate of Withdrawals Per 1,000 Members	
Age	
22	90
27	70
32	35
37	35
42	35
47	35
52	30



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IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Probability of Electing a Vested Benefit (effective June 30, 2002)

<u>Years of Service</u>	<u>Regular Membership</u>		<u>Special Services</u>
	<u>Males</u>	<u>Females</u>	
5	61%	70%	53%
10	66%	73%	65%
15	71%	80%	85%
20	76%	85%	95%
25	80%	90%	100%
30	80%	90%	100%

Rates of Salary Increase (effective June 30, 1999)

Annual Rate of Increase (%)

<u>Age</u>	<u>Years < 2</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-5</u>	<u>Years 6-7</u>	<u>Years 8-10</u>	<u>Years 11-15</u>	<u>Years 16-20</u>	<u>Years 21+</u>
22	18.5	12.5	8.5	8.0	7.5	6.0	5.5	5.0	4.9
27	15.5	10.0	8.3	7.0	6.5	6.0	5.5	5.0	4.9
32	14.8	9.8	8.0	7.0	6.5	6.0	5.5	5.0	4.9
37	14.7	9.8	8.0	7.0	6.3	6.0	5.5	5.0	4.9
42	14.7	9.2	8.0	7.0	6.2	6.0	5.5	4.9	4.9
47	14.2	9.0	8.0	7.0	6.2	5.5	5.2	4.8	4.2
52	13.3	8.3	6.9	7.0	6.2	5.5	5.0	4.5	4.2
57	12.5	7.7	6.9	7.0	5.7	5.5	4.6	4.5	4.2
62	10.9	7.1	6.7	5.0	4.5	4.5	4.5	4.5	4.0



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APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS



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**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY**

APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS

ECONOMIC ASSUMPTIONS:

Rate of Inflation (effective June 30, 2006)

3.25% per annum

Rate of Crediting Interest on Contribution Balances (effective June 30, 2006)

4.00% per annum, compounded annually

Rate of Investment Return (effective June 30, 1996)

7.50% per annum, compounded annually, net of expenses.

Wage Growth Assumption (effective June 30, 1999)*

4.00% per annum based on 3.25% inflation assumption and 0.75% real wage inflation.

*Total of 4.0% did not change but the components changed June 30, 2006

Payroll Increase Assumption (effective June 30, 1999)

4.00% per year

DEMOGRAPHIC ASSUMPTIONS:

Rates of Mortality (effective June 30, 2002)

		<u>Regular Membership</u>	<u>Special Services</u>
Males:	Retirees:	RP-2000 Healthy Annuitant Table, Set Forward One Year	RP-2000 Healthy Annuitant Table Set Forward Three Years
	Actives:	RP-2000 Employee Table, Set Forward One Year	RP-2000 Employee Table Set Forward Three Years
Females:	Retirees:	RP-2000 Healthy Annuitant Table, Set Back Two Years	RP-2000 Healthy Annuitant Table No Age Adjustment
	Actives:	RP-2000 Employee Table, Set Back Two Years	RP-2000 Employee Table No Age Adjustment
		The RP-2000 Tables are used with generational mortality	
Beneficiaries:	Same as members		Same as members
Disabled Members:	Annual rates are the greater of 3% or 2.5% plus the corresponding non-disabled rate (based on GAM 94 for males, 95% of GAM 94 for females)		Same as healthy members set forward 6 years

For Special Services active members, 5% of deaths are assumed to be service related.



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IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Retirement Rates (effective June 30, 2002)

Upon meeting the requirements for early retirement, the following rates apply to regular members:

<u>Age</u>	<u>Assumed Retirement Rate</u>
55-59	5%
60	10
61	15
62	25
63-64	20

Upon reaching the requirements for normal retirement, the following rates apply:

<u>Age</u>	<u>Assumed Retirement Rates</u>		
	<u>1st Year Eligible</u>	<u>After 1st Year</u>	<u>Special Services</u>
55	20%	10%	15%
56	20%	10%	10%
57-59	20%	20%	10%
60	25%	25%	10%
61	35%	30%	20%
62	50%	40%	35%
63	35%	30%	20%
64	35%	35%	35%
65	30%	45%	100%
66	20%	20%	100%
67-68	15%	15%	100%
69	15%	35%	100%
70+	100%	100%	100%

Special Services Group 1 ages 50 to 55 with 22 years of service effective: 30%

Terminated vested members are assumed to retire at age 62 (55 for Special Services).

For regular membership, retired re-employed members are assumed to retire at a rate of 25% per year until age 80 when all are assumed to retire.

**Rates of Disablement (effective June 30, 1999 for Regular Membership),
(effective June 30, 2006 for Special Services)**

<u>Age</u>	<u>Annual Rate Per 1,000 Members</u>		
	<u>Males</u>	<u>Females</u>	<u>Special Services</u>
27	0.2	0.2	1.1
32	0.2	0.2	1.2
37	0.4	0.3	1.8
42	0.7	0.5	3.5
47	1.4	0.9	6.5
52	3.3	2.2	14.6
57	6.3	3.9	26.0
62	9.0	6.2	48.7



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IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Rates of Termination of Employment (effective June 30, 2002)

Regular Membership

		Annual Rate of Withdrawals Per 1,000 Members					
<u>Males:</u>		<u>Years 0-1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-6</u>	<u>Years 7-8</u>	<u>Years 9+</u>
<u>Age</u>							
22		330.0	250.0	165.0	165.0	110.0	66.0
27		231.0	145.0	121.0	99.0	88.0	66.0
32		198.0	145.0	110.0	74.8	55.0	38.5
37		195.8	140.0	110.0	74.8	49.5	33.0
42		195.8	140.0	110.0	74.8	49.5	25.3
47		195.8	130.0	99.0	74.8	49.5	19.8
52		176.0	110.0	77.0	74.8	49.5	19.8
55+		165.0	110.0	55.0	74.8	49.5	19.8
<u>Females:</u>		<u>Years 0-1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-6</u>	<u>Years 7-8</u>	<u>Years 9+</u>
<u>Age</u>							
22		330.0	250.0	220.0	220.0	165.0	55.0
27		275.0	170.0	140.0	110.0	99.0	55.0
32		247.5	170.0	140.0	104.5	71.5	49.5
37		198.0	150.0	110.0	104.5	66.0	36.3
42		198.0	150.0	110.0	88.0	60.5	30.8
47		198.0	130.0	110.0	82.5	49.5	25.3
52		198.0	130.0	110.0	82.5	49.5	25.3
55+		198.0	130.0	110.0	82.5	49.5	25.3

Special Services

**Annual Rate of Withdrawals
Per 1,000 Members**

Age	
22	90
27	70
32	35
37	35
42	35
47	35
52	30



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IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM
2001 - 2005 EXPERIENCE STUDY

Probability of Electing a Vested Benefit (effective June 30, 2002)

<u>Years of Service</u>	<u>Regular Membership</u>		<u>Special Services</u>
	<u>Males</u>	<u>Females</u>	
5	61%	70%	53%
10	66%	73%	65%
15	71%	80%	85%
20	76%	85%	95%
25	80%	90%	100%
30	80%	90%	100%

Rates of Salary Increase* (effective June 30, 2006)

<u>Years of Service</u>	<u>Annual Increase</u>	<u>Years of Service</u>	<u>Annual Increase</u>	<u>Years of Service</u>	<u>Annual Increase</u>
		11	5.3%	22	4.5%
Under 2	12.0%	12	5.2%	23	4.4%
2	9.5%	13	5.1%	24	4.4%
3	7.7%	14	5.0%	25	4.4%
4	7.1%	15	4.9%	26	4.3%
5	6.6%	16	4.8%	27	4.3%
6	6.1%	17	4.7%	28	4.2%
7	5.9%	18	4.6%	29	4.1%
8	5.7%	19	4.6%	30	4.0%
9	5.5%	20	4.5%	Over 30	4.0%
10	5.4%	21	4.5%		

*Includes 4.0% wage growth.



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APPENDIX C

MORTALITY



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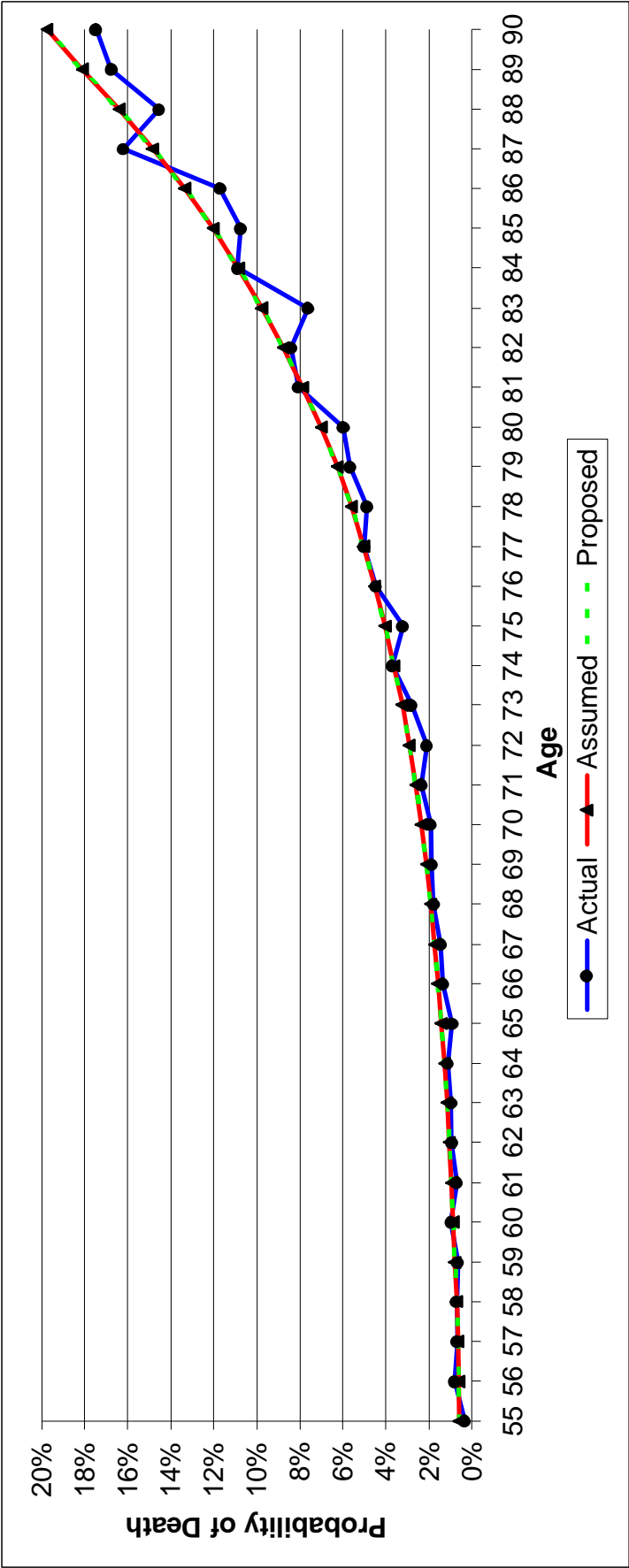
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-1

Probability of Death - Healthy Retirees

Males - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Count	3,601	3,972	3,972
Actual/Expected		91%	91%

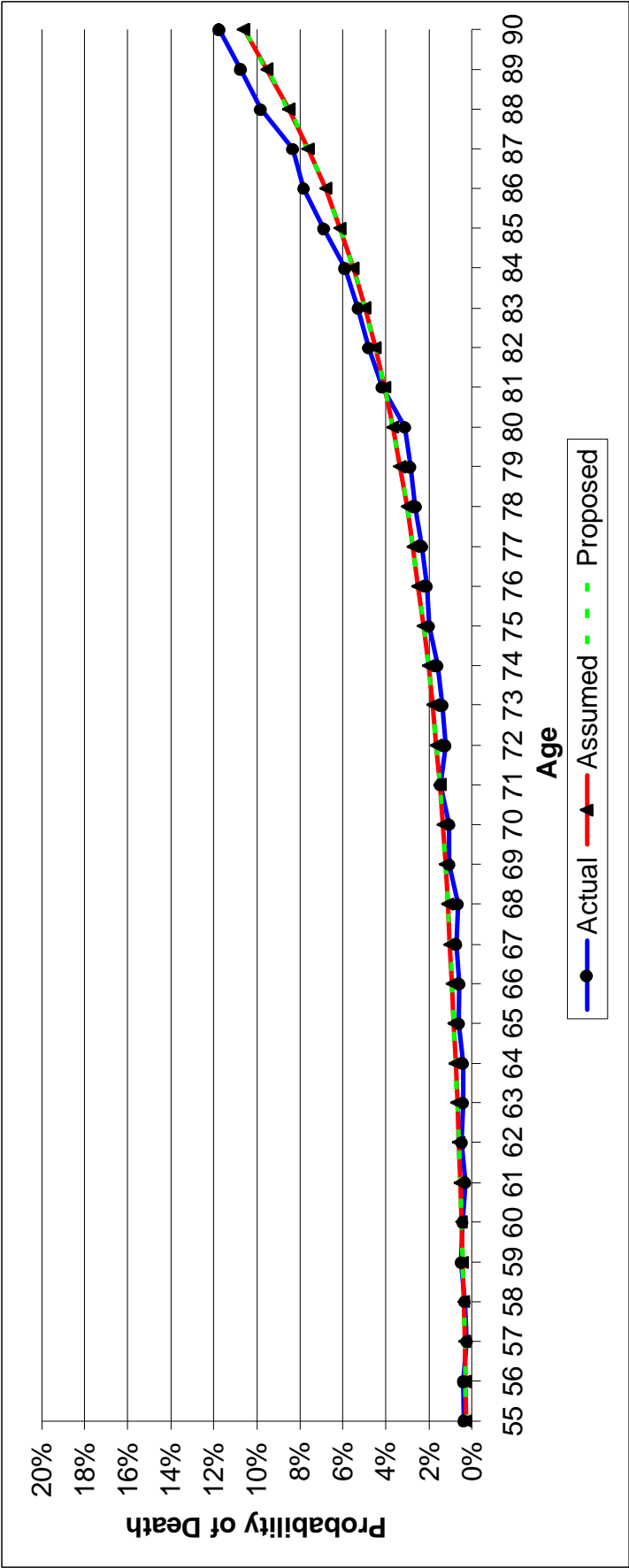
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-2

Probability of Death - Healthy Retirees

Females - Regular Membership



		Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Count		3,919	4,087	4,087
Actual/Expected			96%	96%

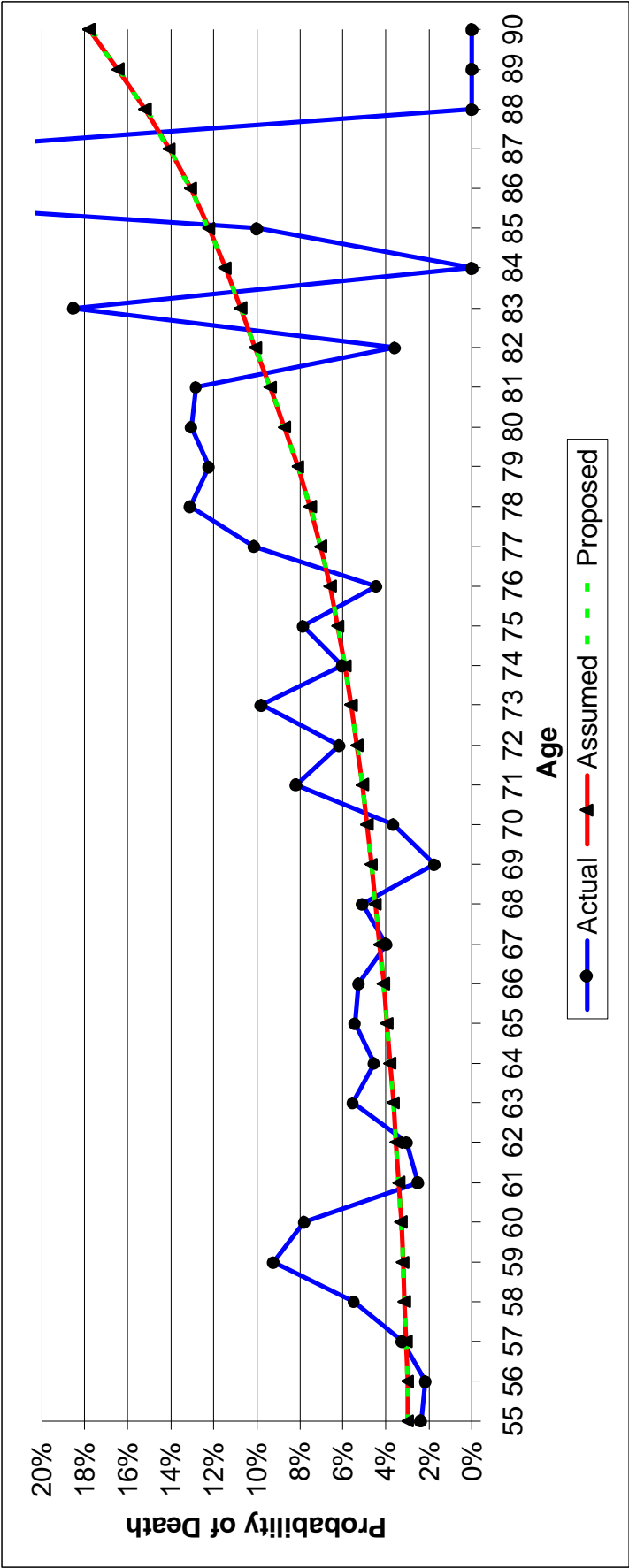
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-3

Probability of Death - Disabled Retirees

Males - Regular Membership



Actual		Expected - Current Assumptions	Expected - Proposed Assumptions
Count	224	180	180
Actual/Expected		124%	124%

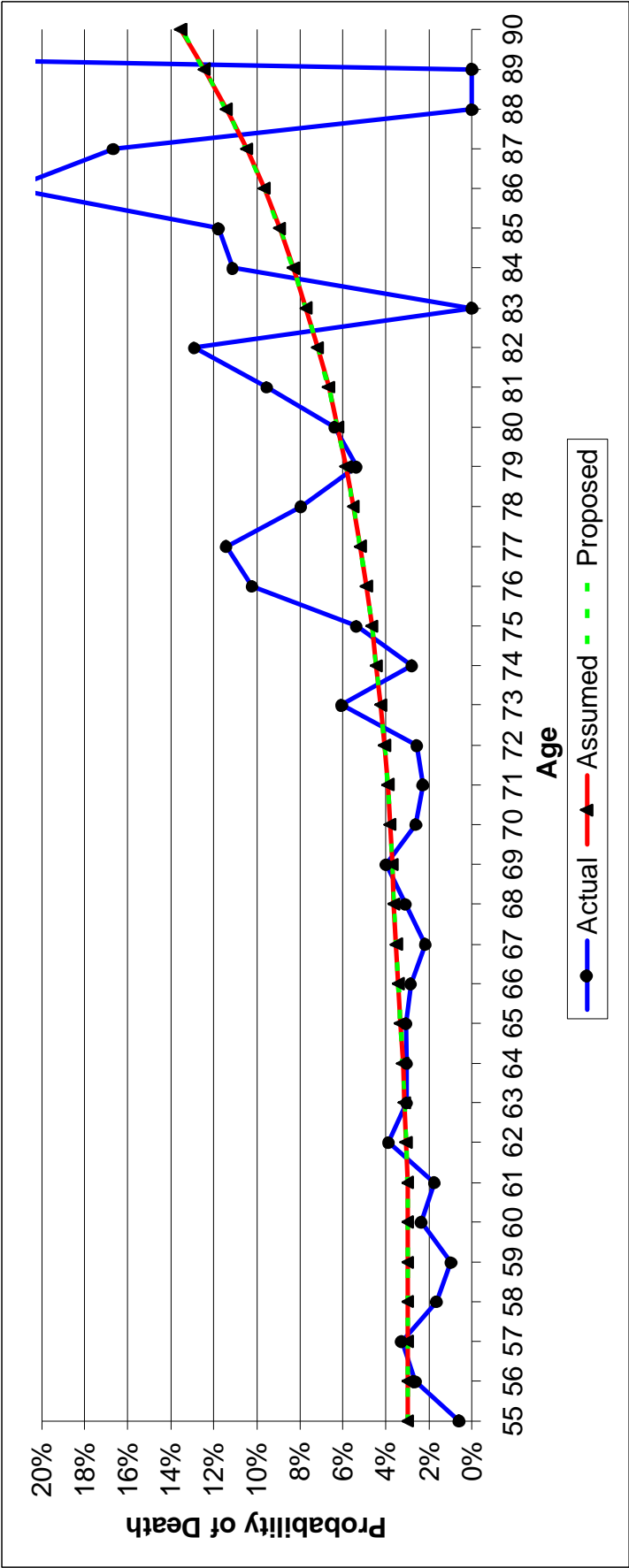
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-4

Probability of Death - Disabled Retirees

Females - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Count	158	170	170
Actual/Expected		93%	93%

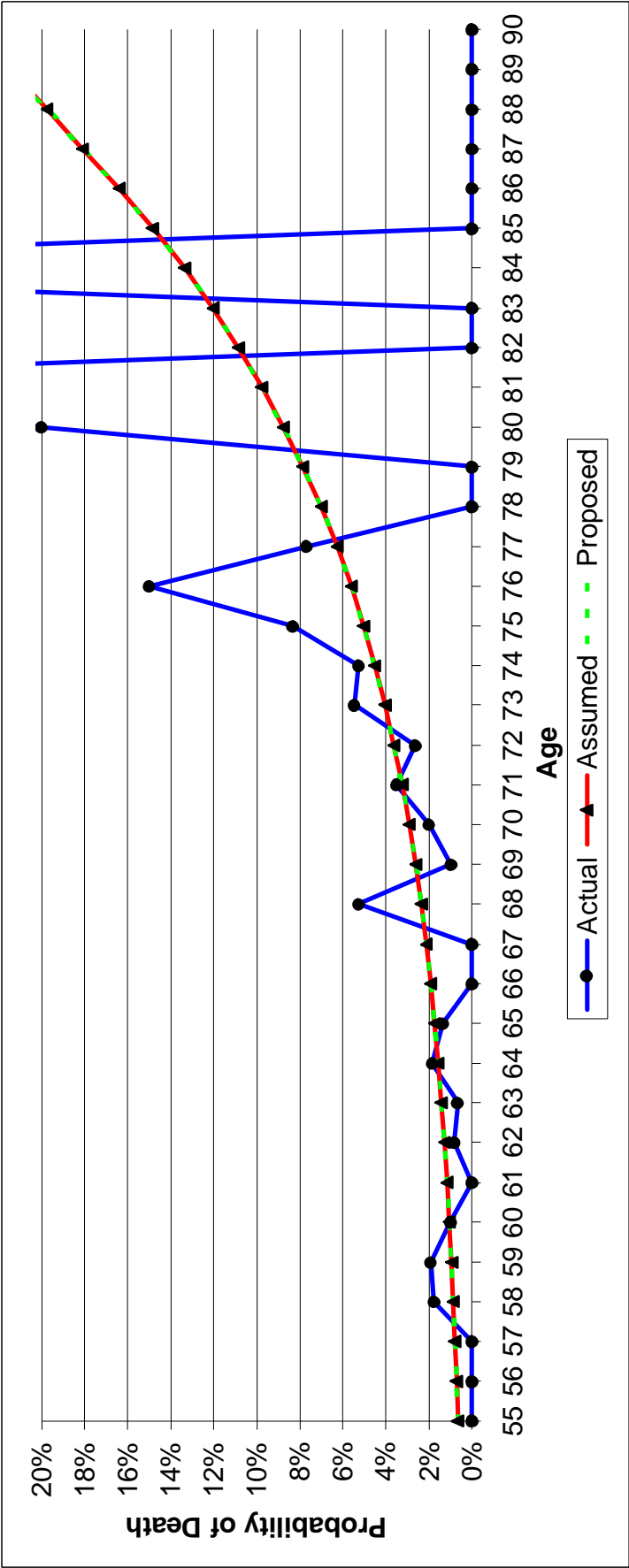
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-5

Probability of Death - Healthy Retirees

Males - Special Services



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Count	40	44	44
Actual/Expected		91%	91%

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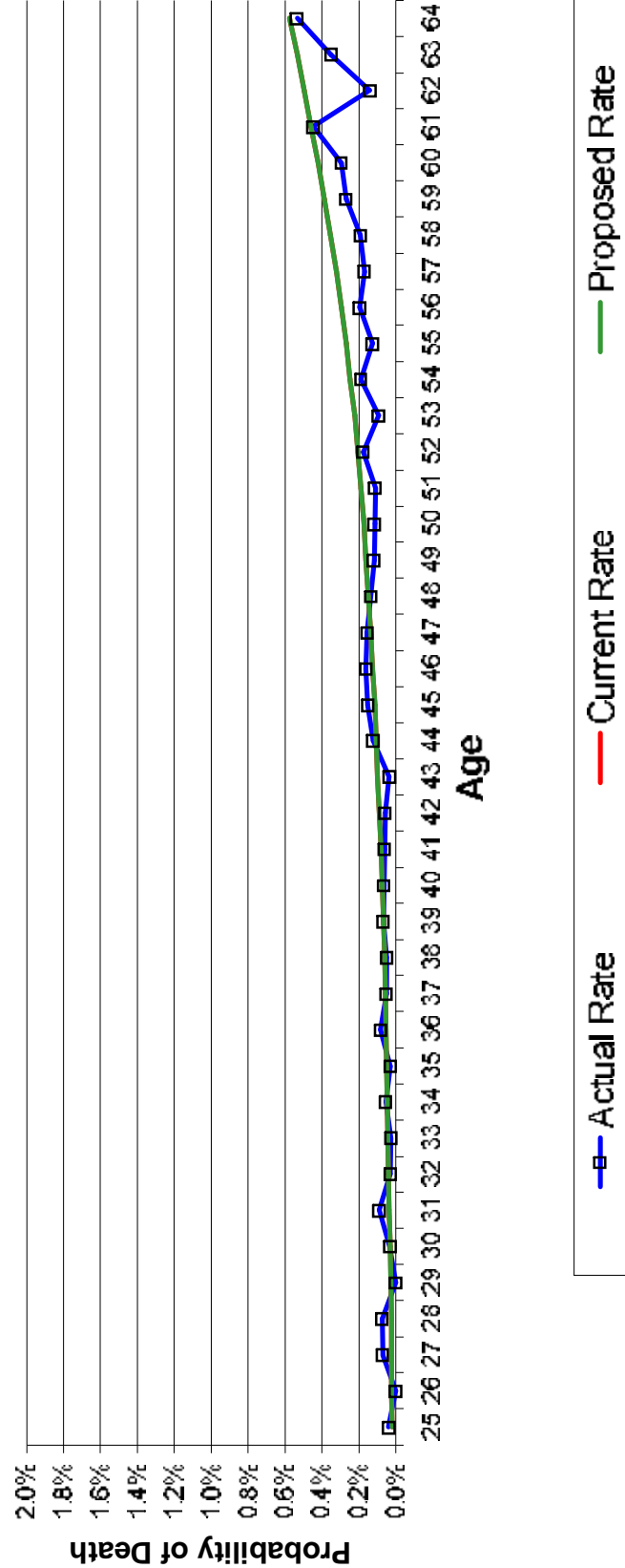
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-6

Probability of Death - Active Members

Males - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	234	317	317
Actual/Expected		74%	74%

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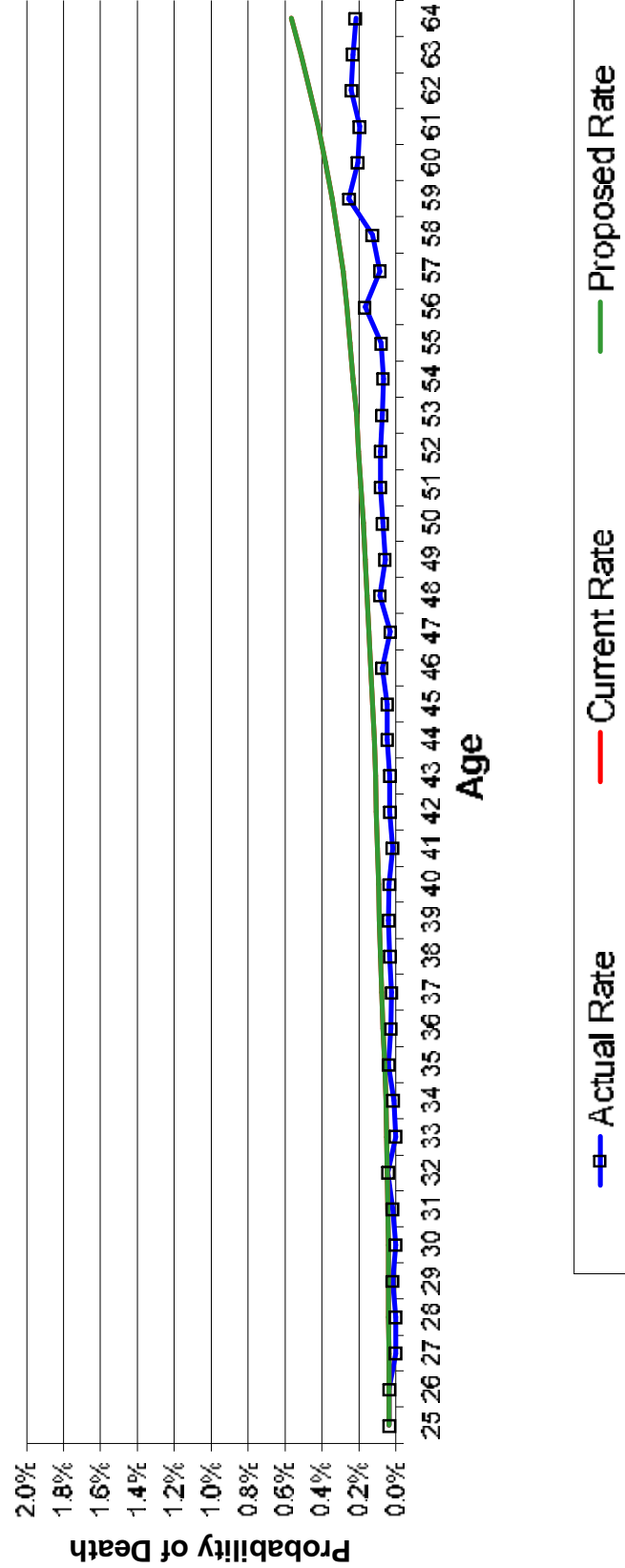
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit C-7

Probability of Death - Active Members

Females - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	250	605	605
Actual/Expected		41%	41%

APPENDIX D

RETIREMENT



Milliman

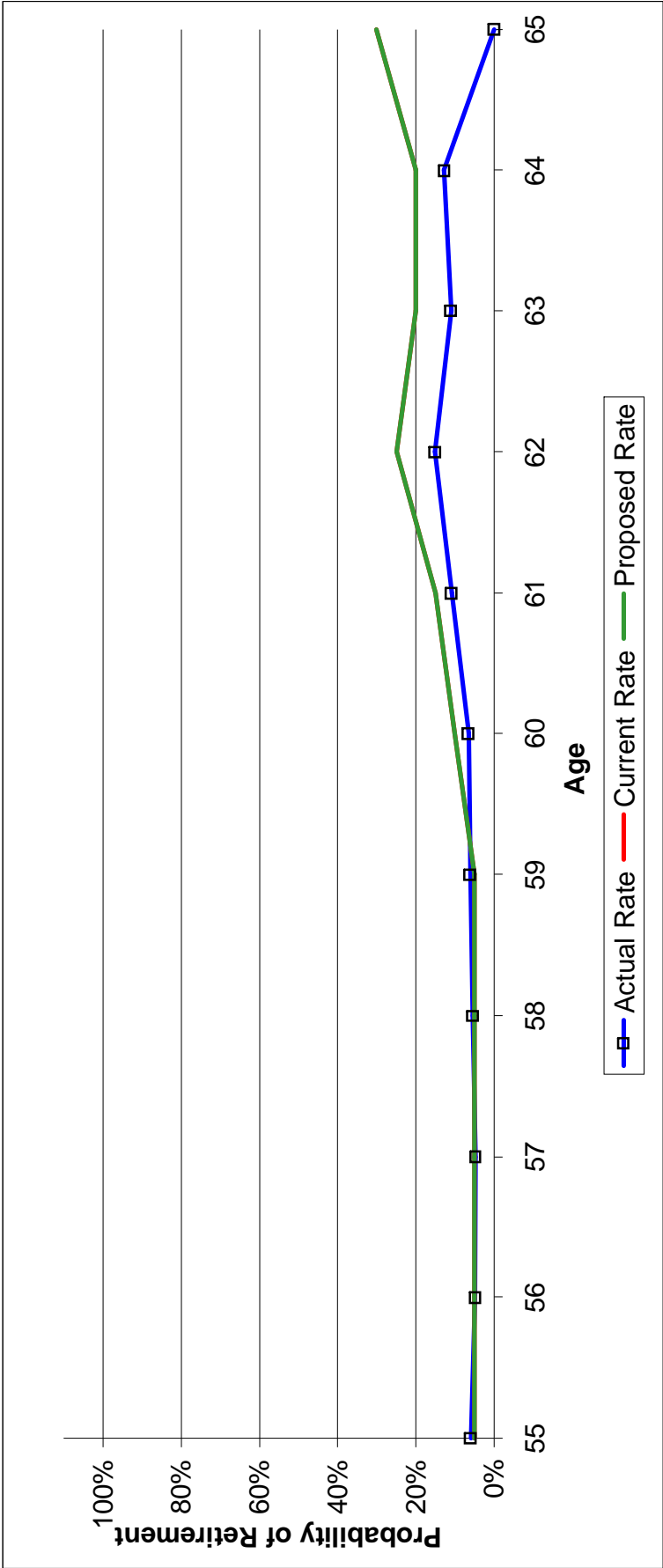
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Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-1

Retirement Rates - Early Regular Membership



Total Count	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
	6,285	7,555 83%	7,555
Actual/Expected		83%	83%

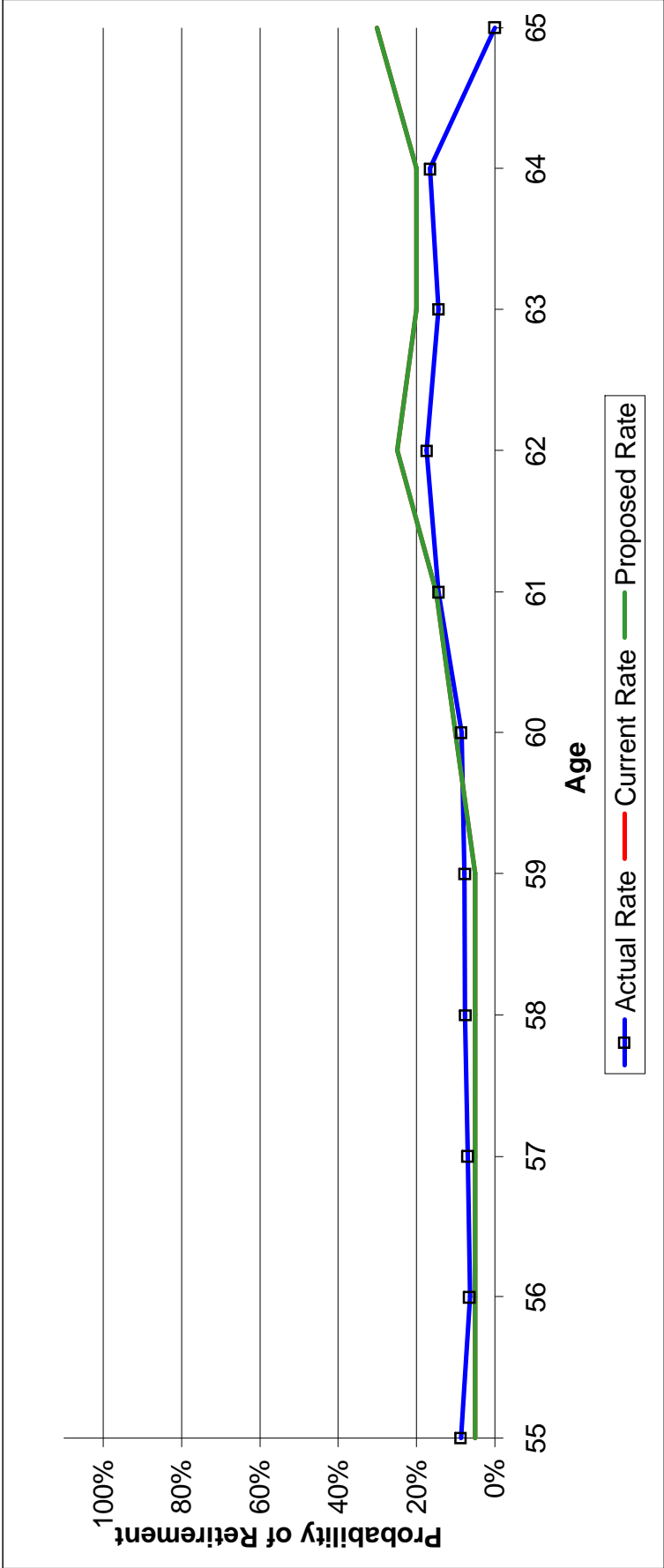
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-2

Retirement Rates - Early

Regular Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	380,365	305,726	305,726
Actual/Expected		124%	124%

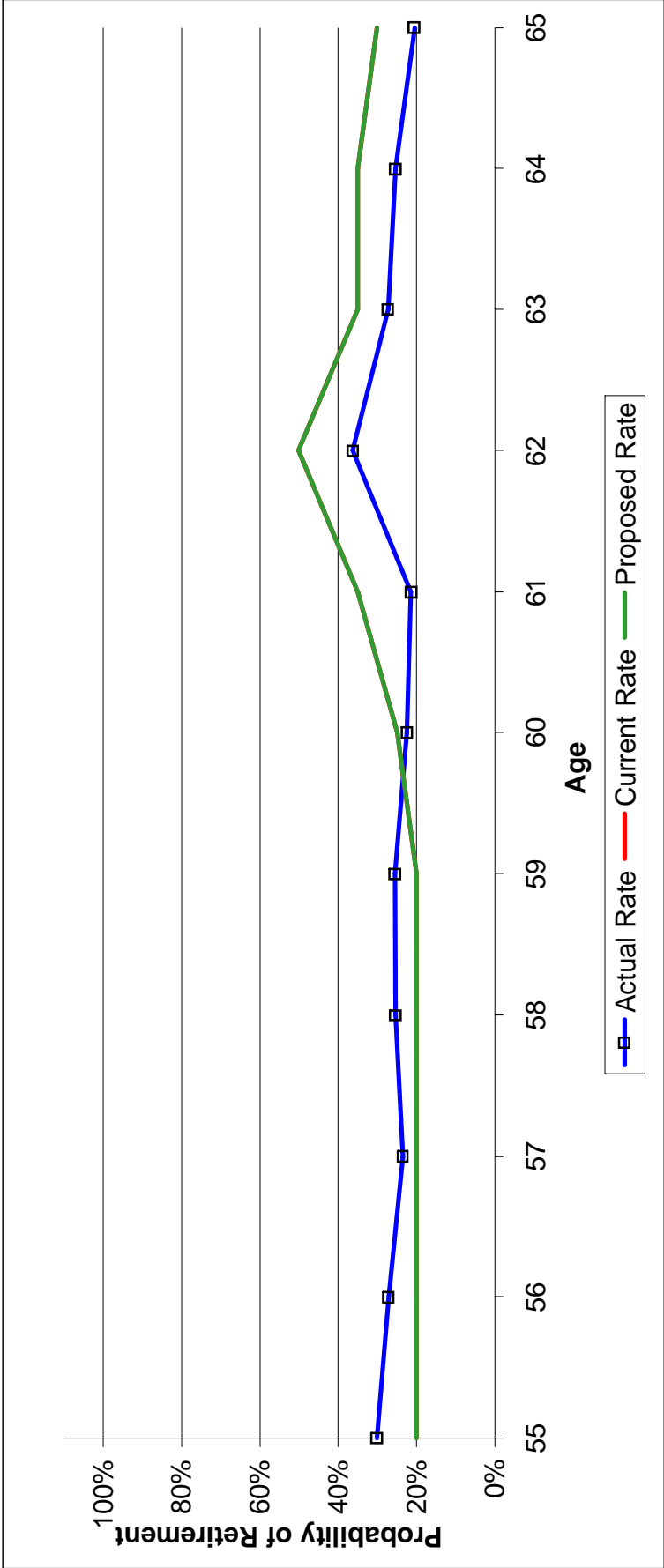
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Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-3

Retirement Rates - Select Unreduced Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,327	2,523	2,523
Actual/Expected		92%	92%

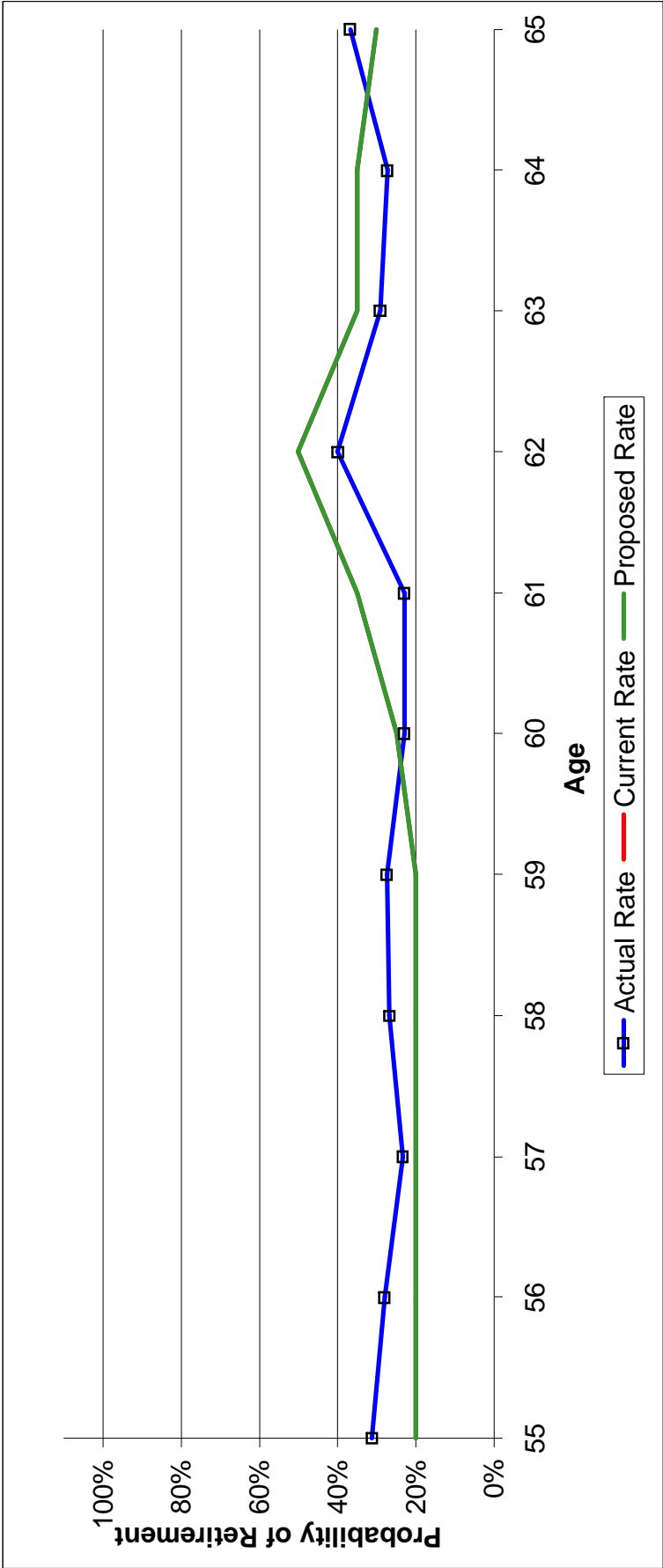
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Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-4

Retirement Rates - Select Unreduced Regular Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	255,556	217,359	217,359
Actual/Expected		118%	118%

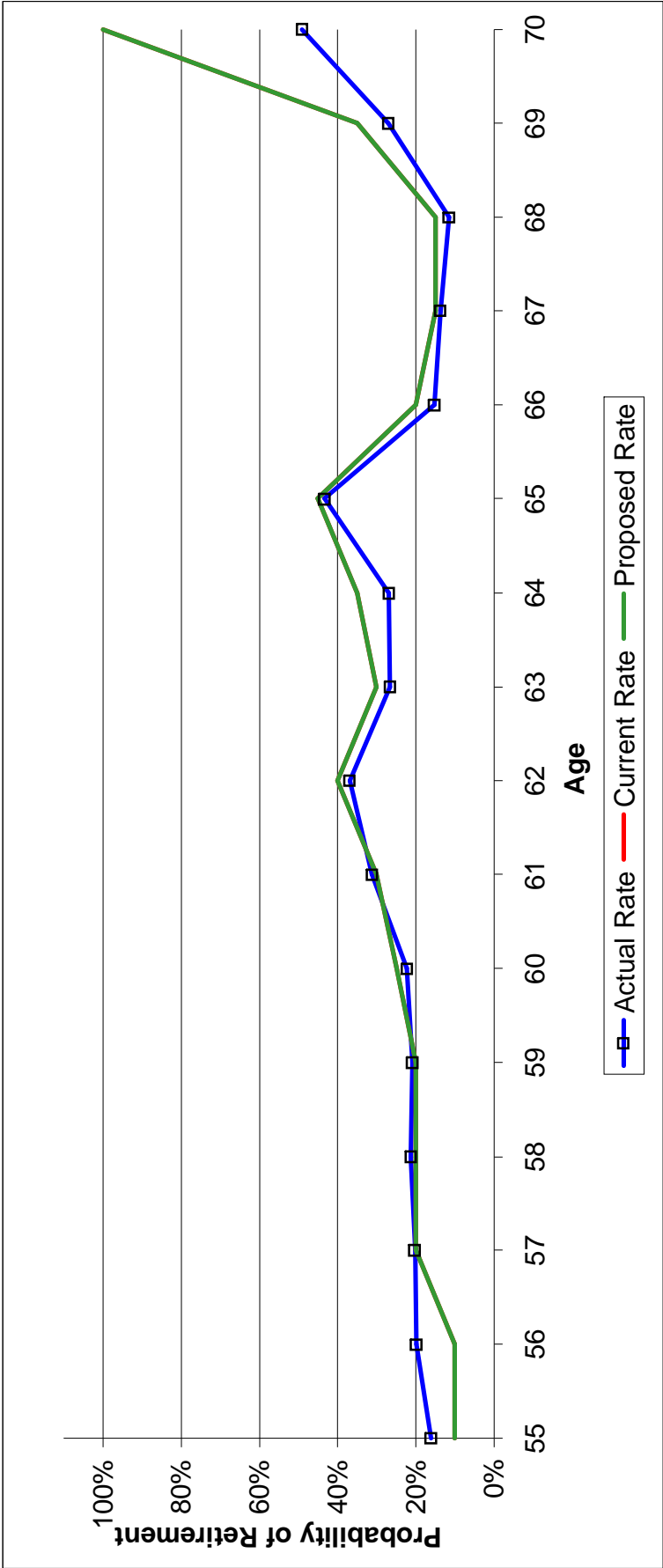
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Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-5

Retirement Rates - Ultimate Unreduced Regular Membership



Total Count	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
	5,980	7,116	7,116
Actual/Expected		84%	84%

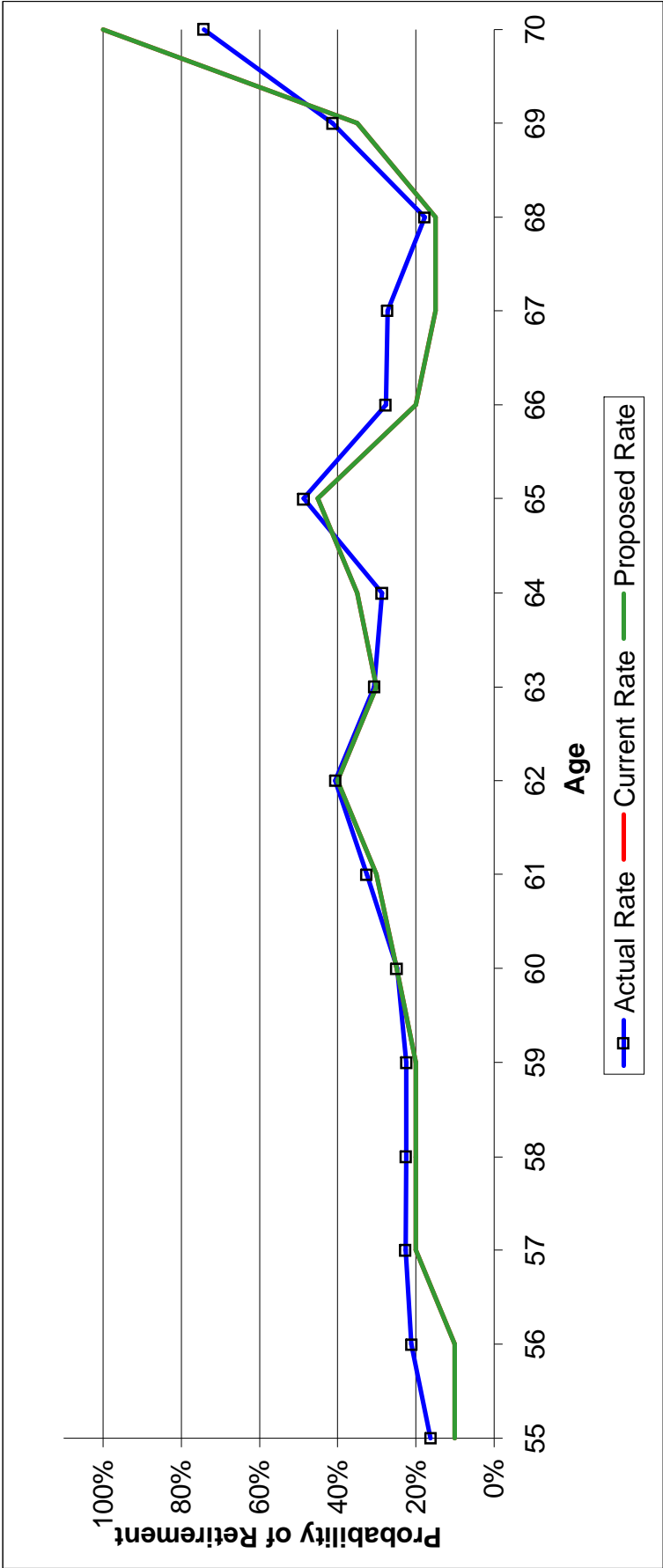
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Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-6

Retirement Rates - Ultimate Unreduced Regular Membership (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	607,505	559,851	559,851
Actual/Expected		109%	109%

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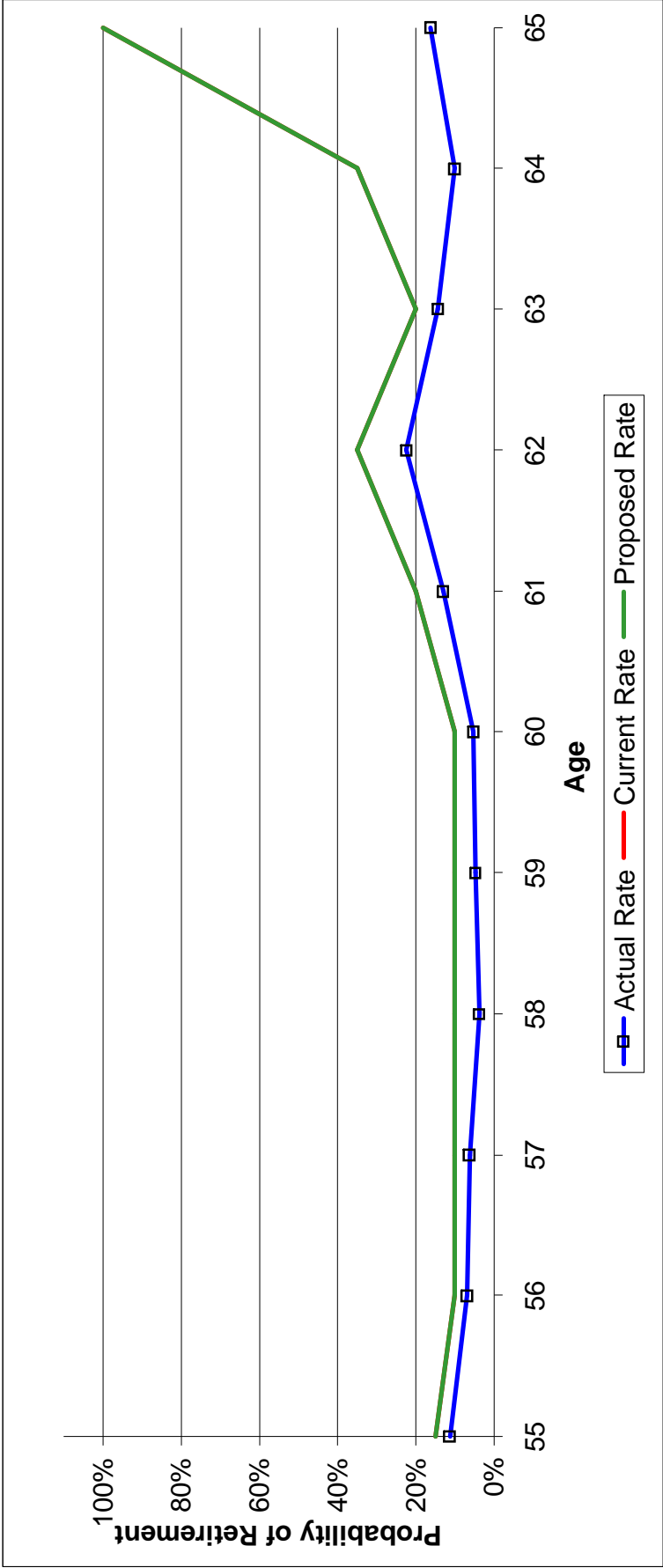
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-7

Retirement Rates

Special Services



Total Count	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Actual/Expected	346	669	669
		52%	52%

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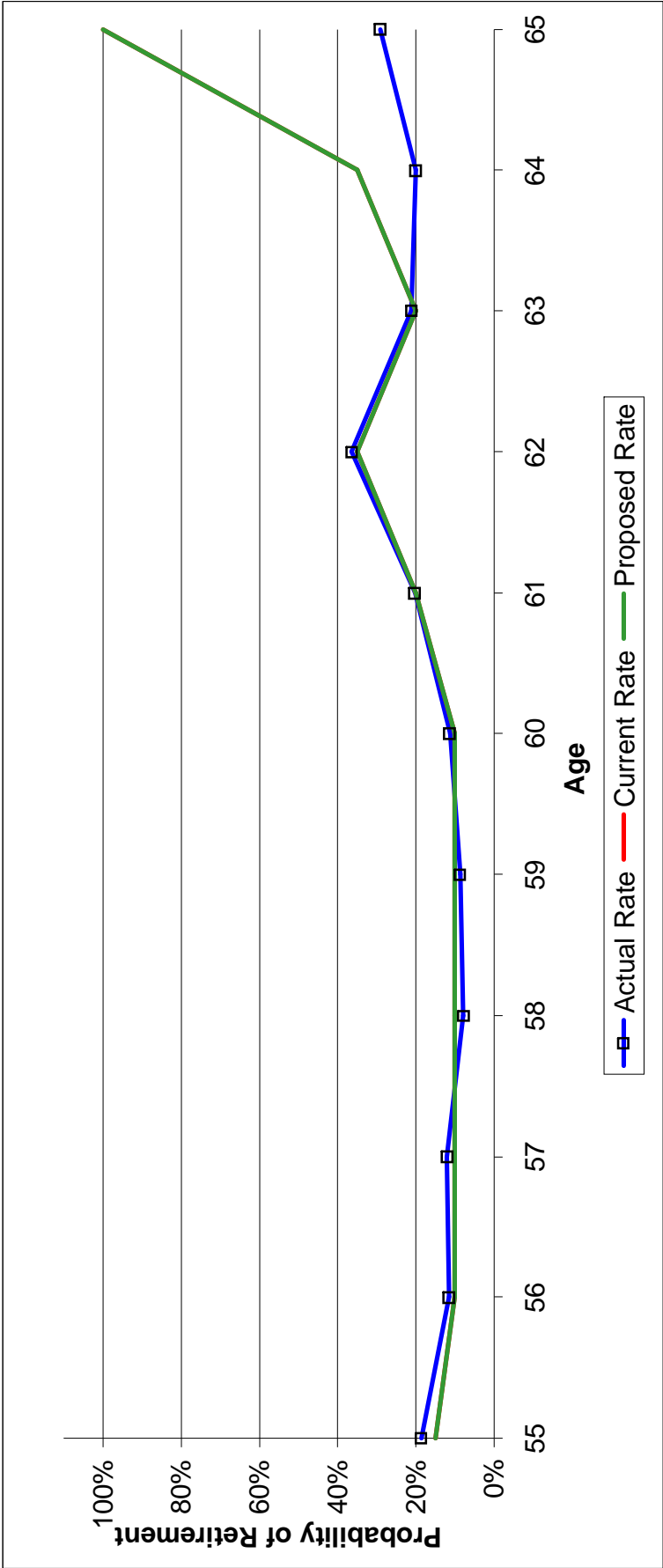
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit D-8

Retirement Rates

Special Services (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	35,150	35,948	36,948
Actual/Expected		95%	95%

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APPENDIX E

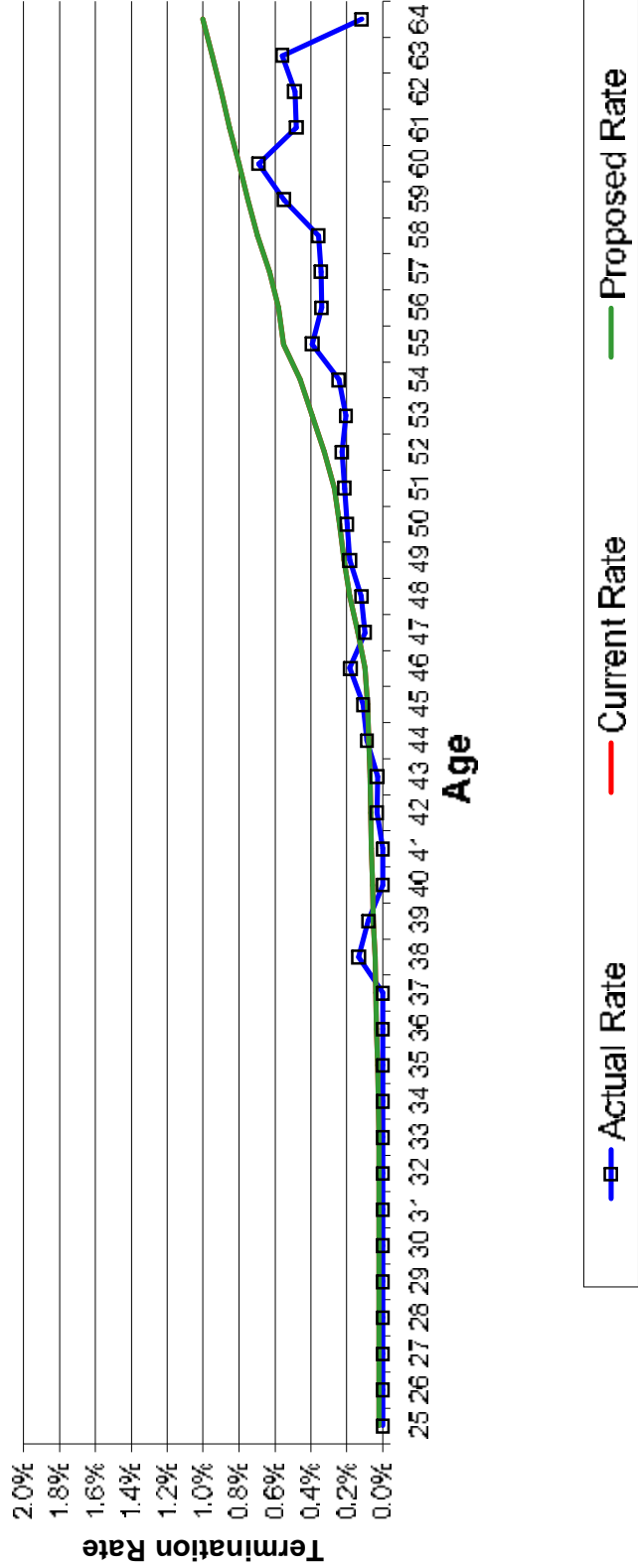
DISABILITY



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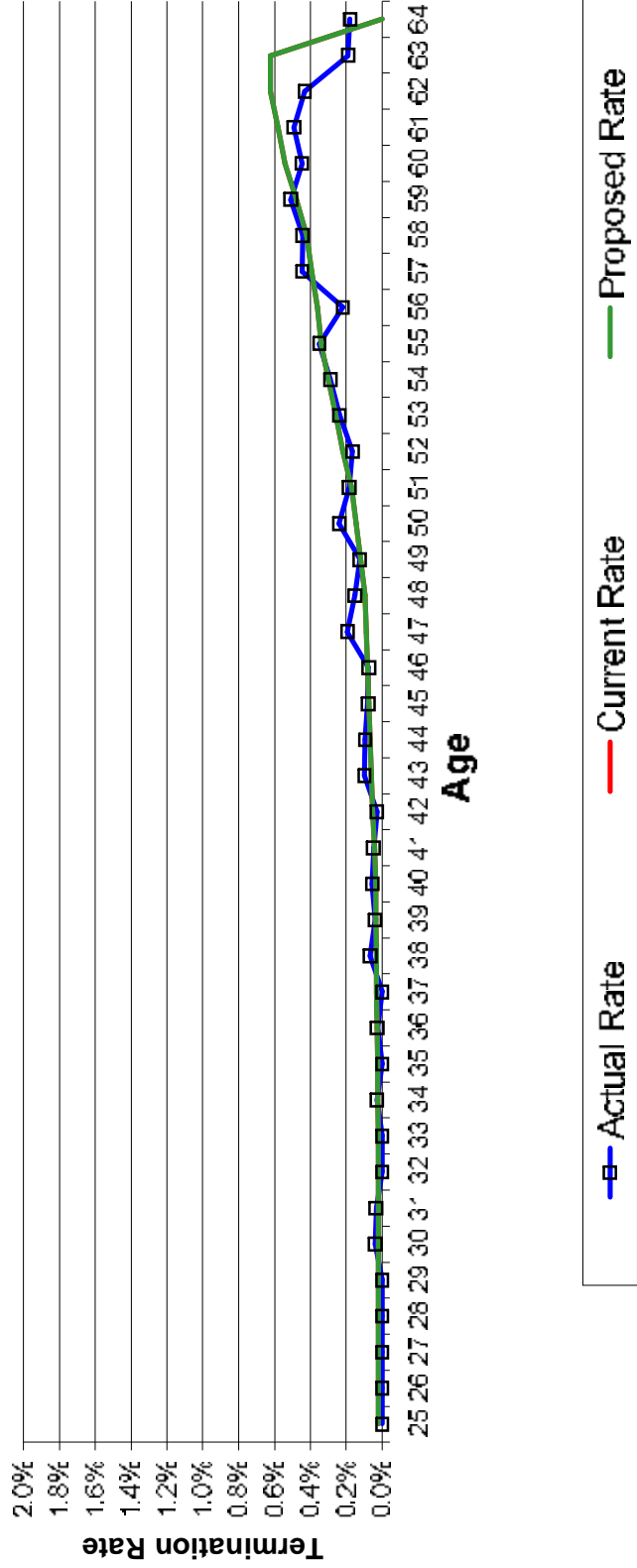
Iowa Public Employees' Retirement System
Experience Study 2001-2005
Exhibit E-1
Rates of Disability
Males - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	197	303	303
Actual/Expected		65%	65%

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Iowa Public Employees' Retirement System
Experience Study 2001-2005
Exhibit E-2
Rates of Disability
Females - Regular Membership



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	350	353	353
Actual/Expected		99%	99%

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APPENDIX F

TERMINATION OF EMPLOYMENT



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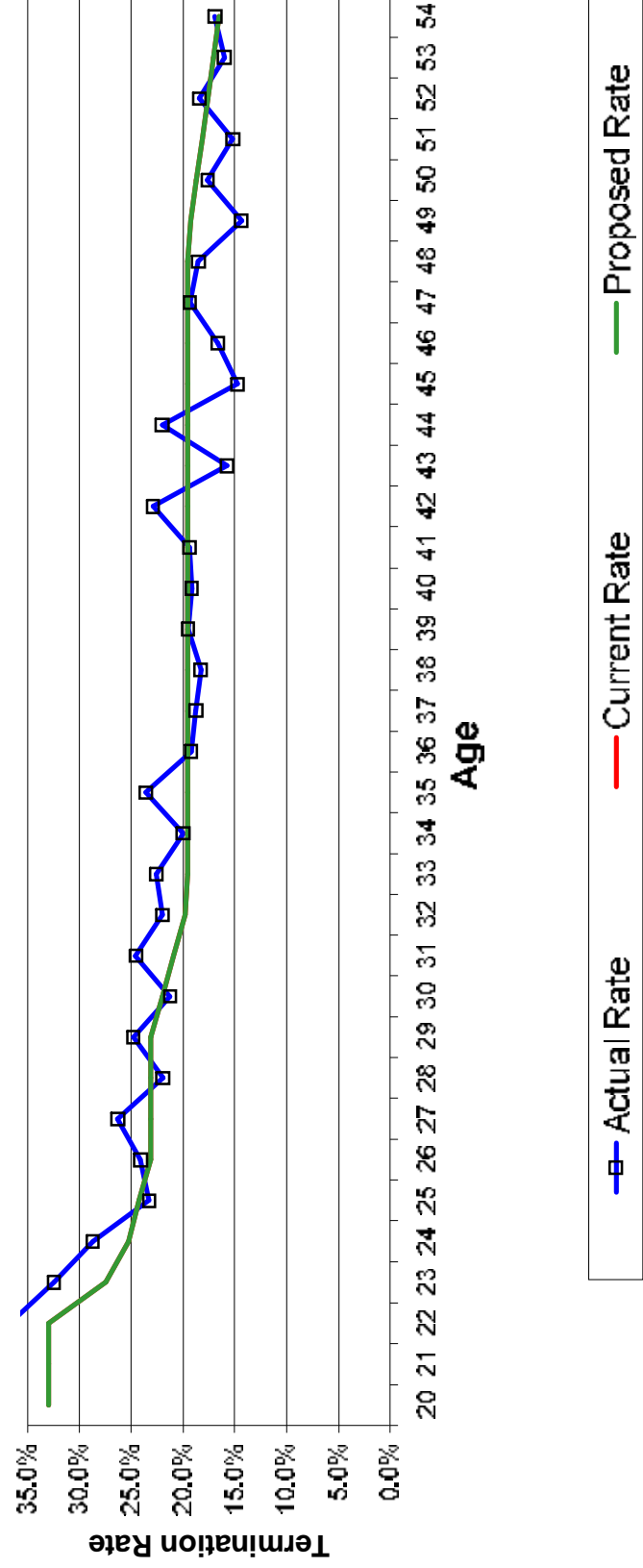
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-1

Termination of Employment

Regular Membership - Males - Under 2 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	5,066	4,880	4,880
Actual/Expected		104%	104%

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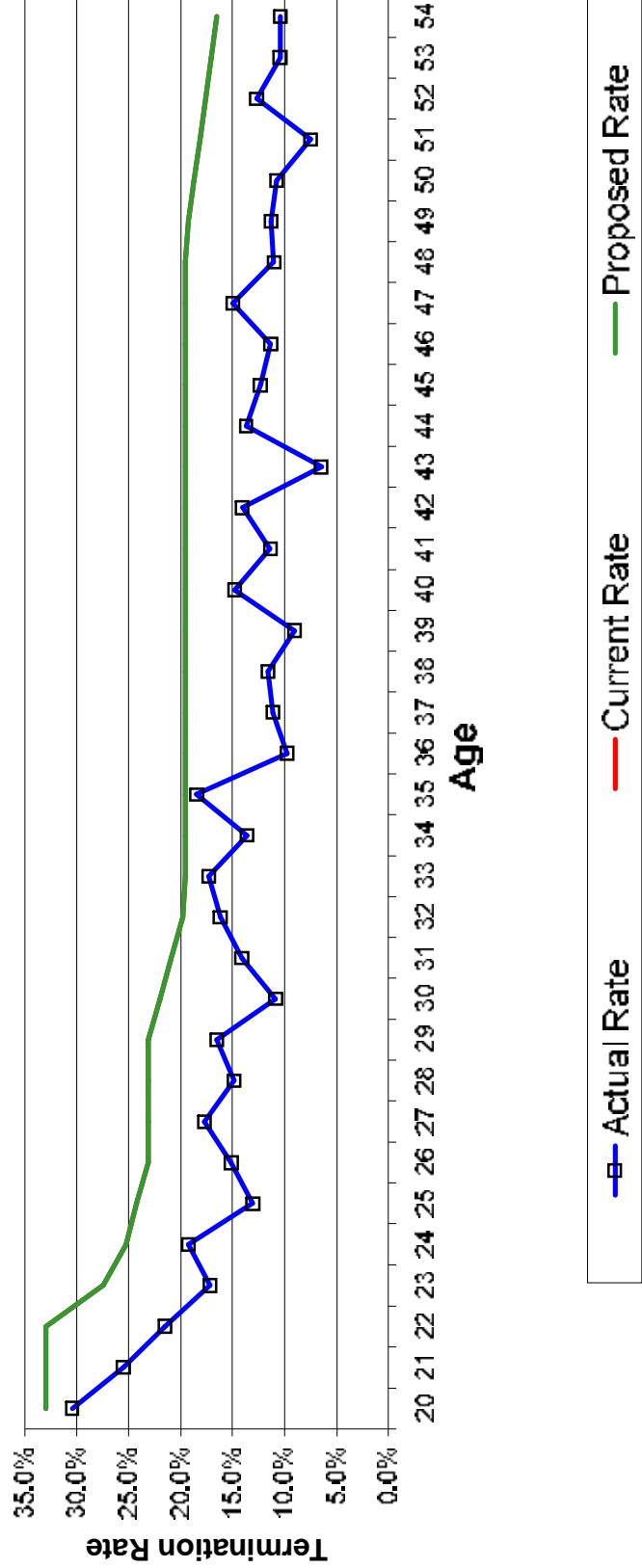
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-2

Termination of Employment

Regular Membership - Males - Under 2 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	4,034	6,165	6,165
Actual/Expected		65%	65%

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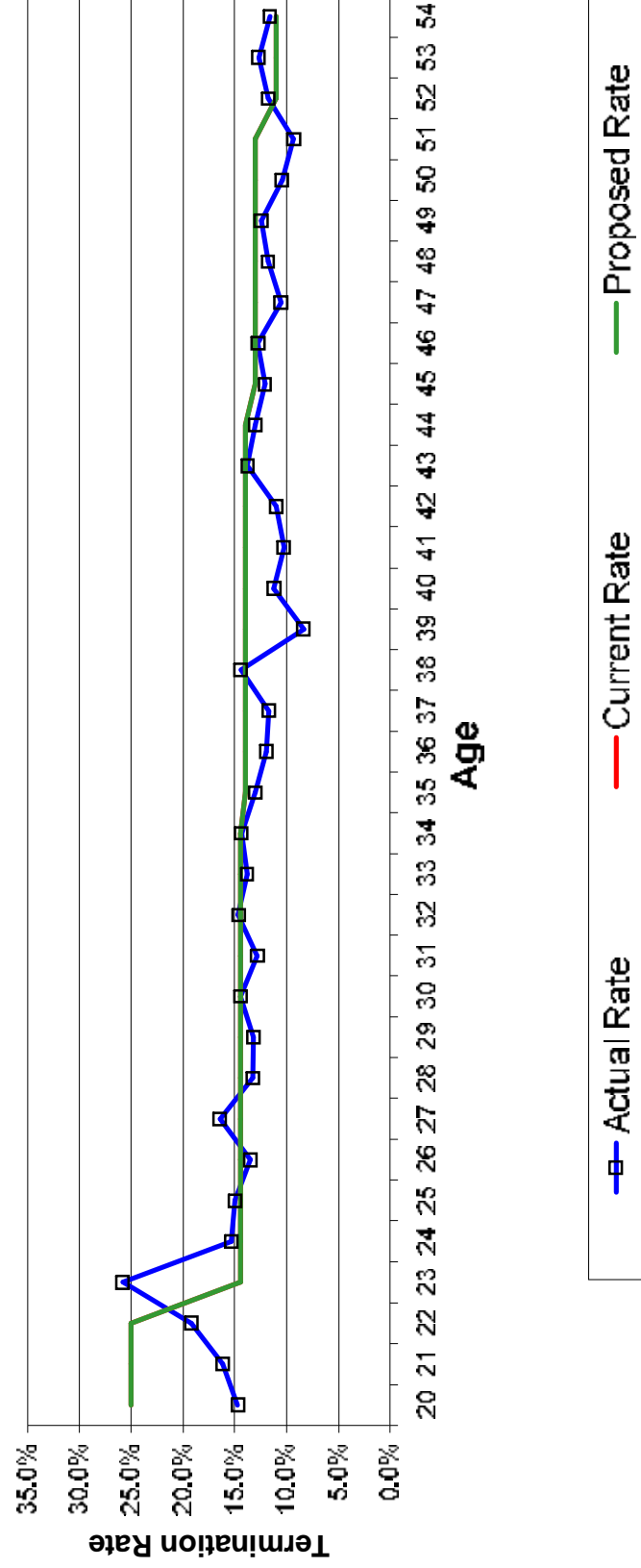
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-3

Termination of Employment

Regular Membership - Males - 2 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,455	1,550	1,550
Actual/Expected		94%	94%

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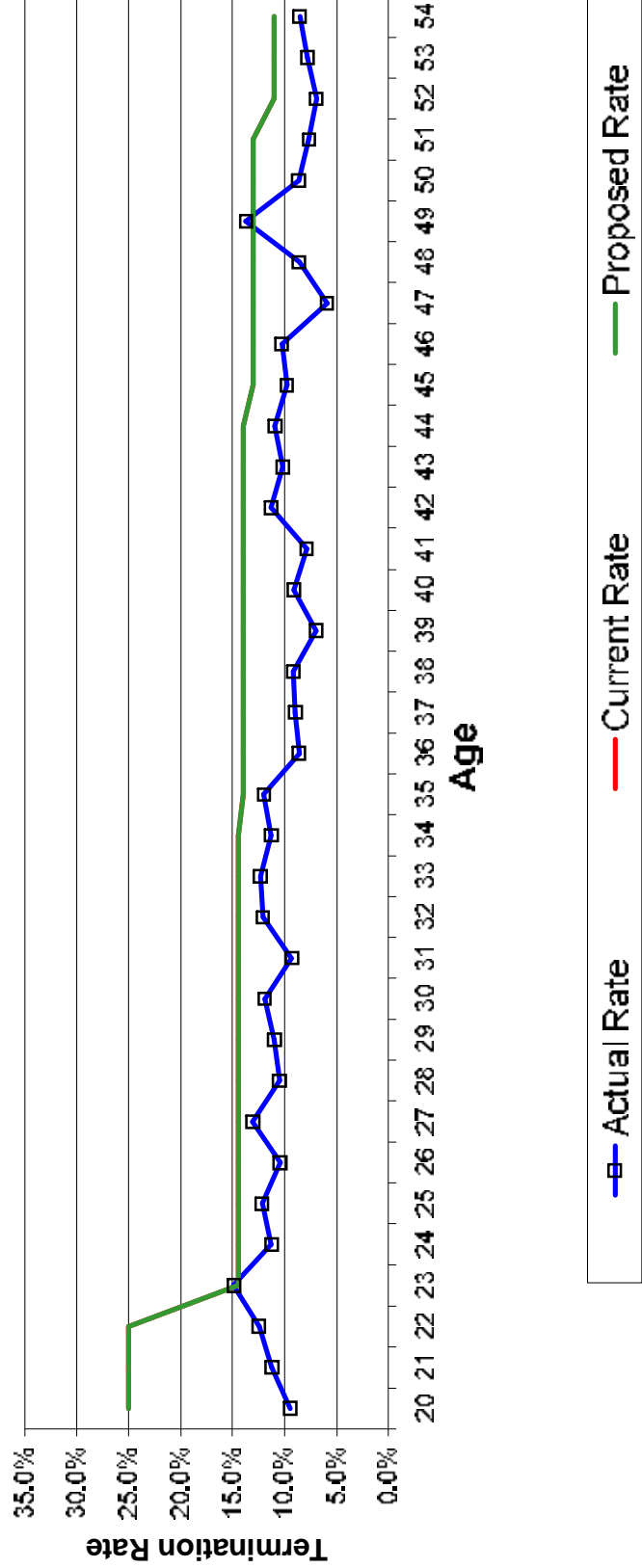
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-4

Termination of Employment

Regular Membership - Males - 2 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	6,249	8.52'	8.52'
Actual/Expected		73%	73%

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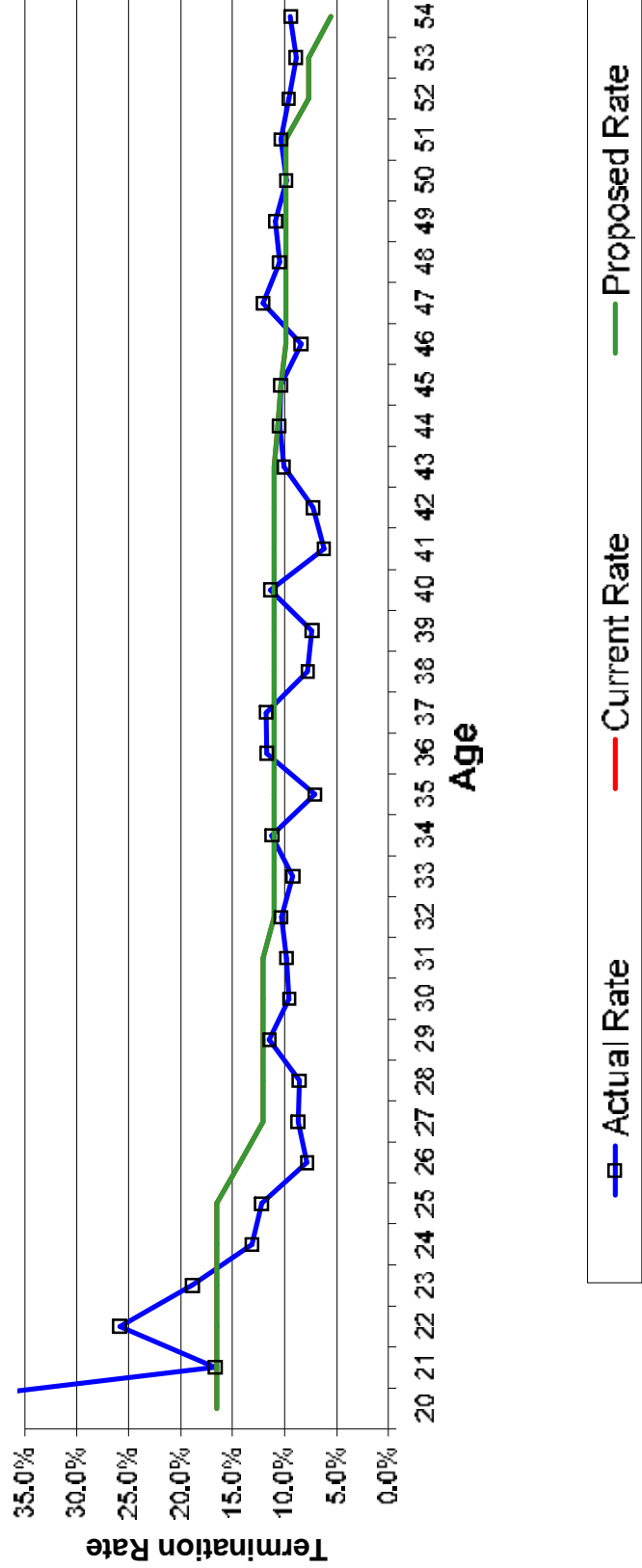
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-5

Termination of Employment

Regular Membership - Males - 3 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	994	1.13'	1.13'
Actual/Expected		88%	88%

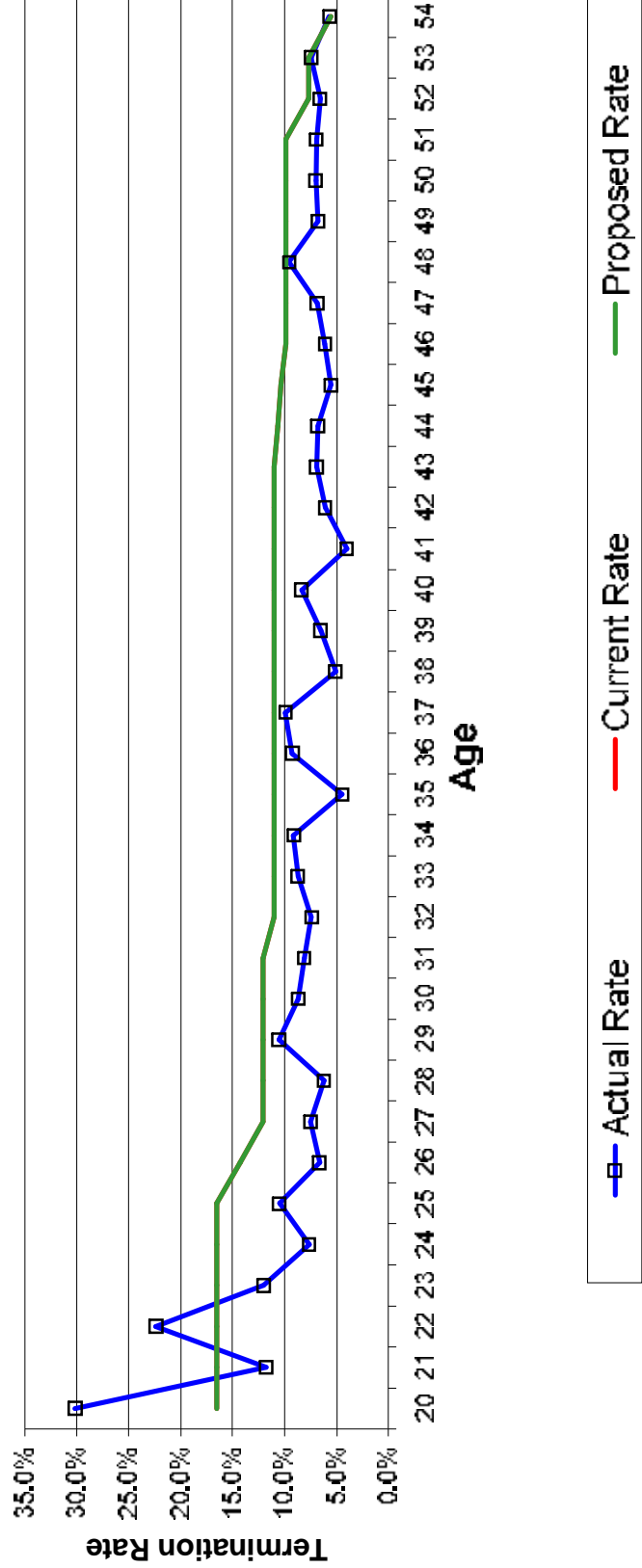
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-6

Termination of Employment

Regular Membership - Males - 3 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	6,745	10,110	10,110
Actual/Expected		67%	67%

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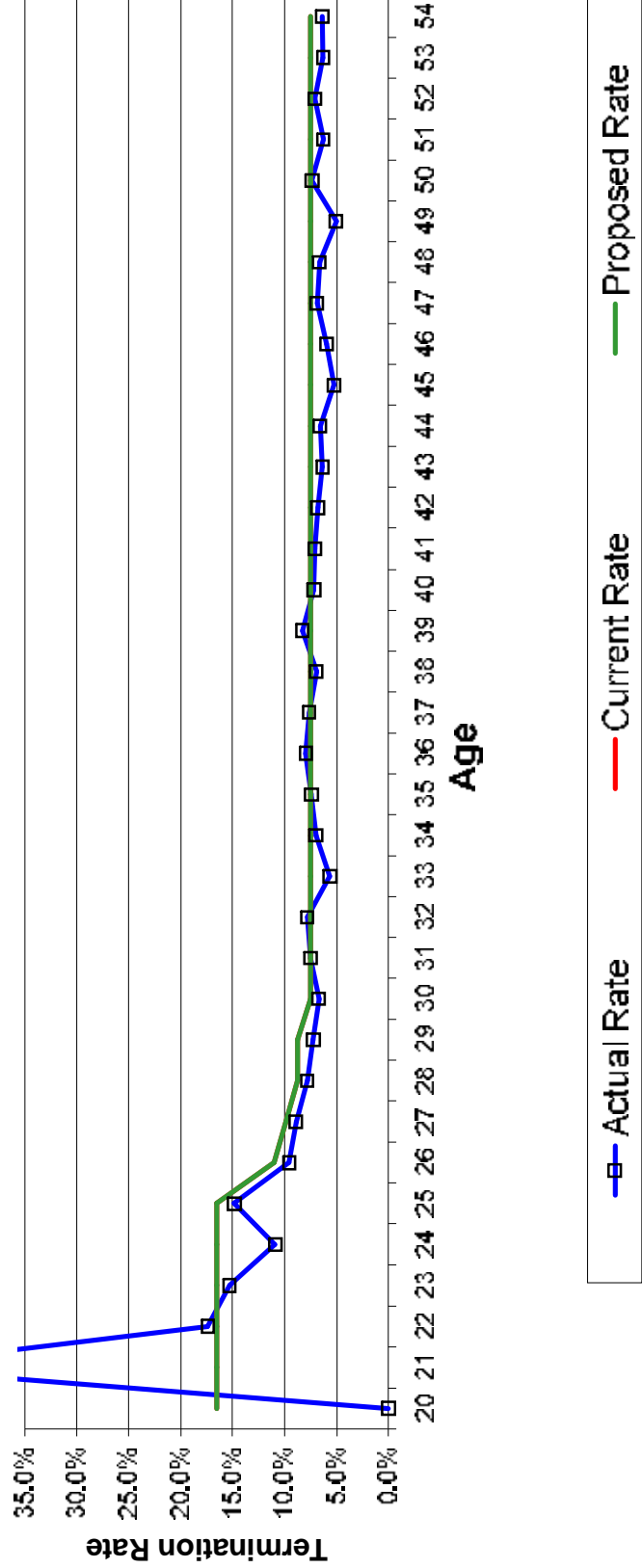
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-7

Termination of Employment

Regular Membership - Males - 4-6 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,628	1,805	1,805
Actual/Expected		90%	90%

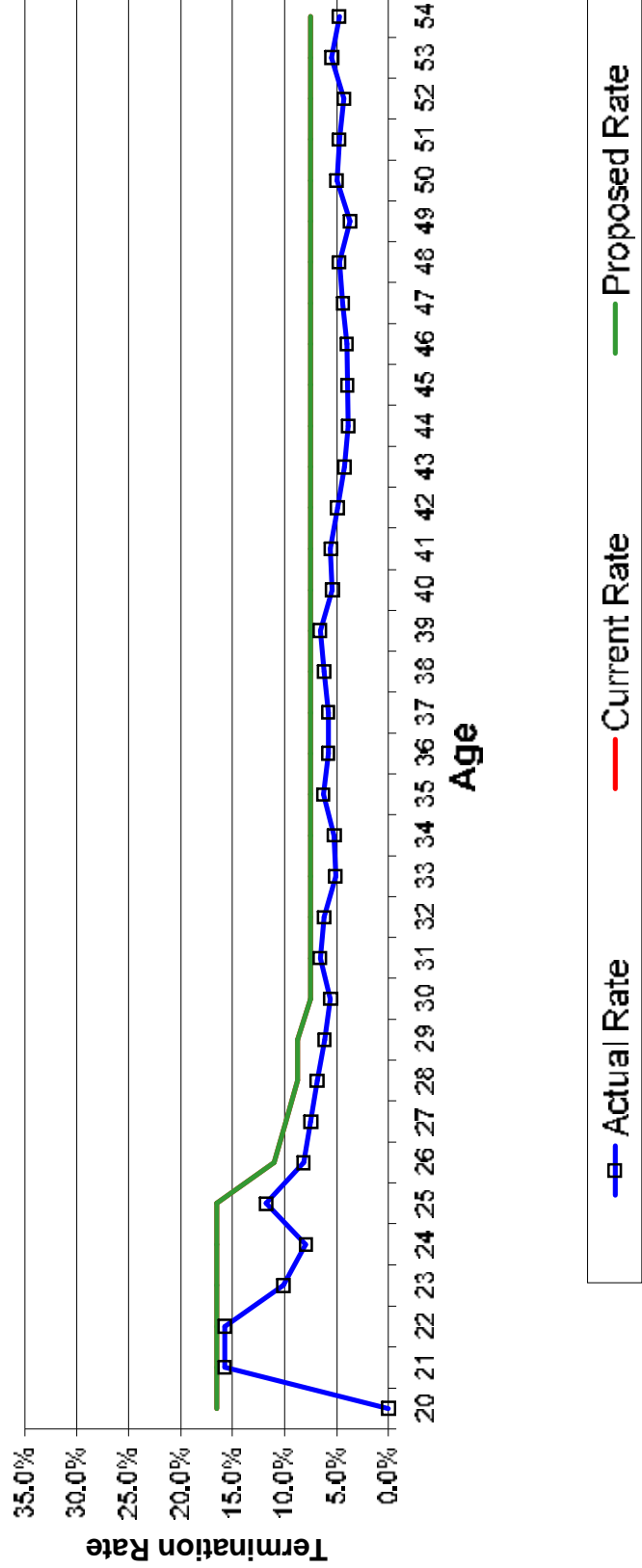
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-8

Termination of Employment

Regular Membership - Males - 4-6 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	20,509	29,104	29,104
Actual/Expected		70%	70%

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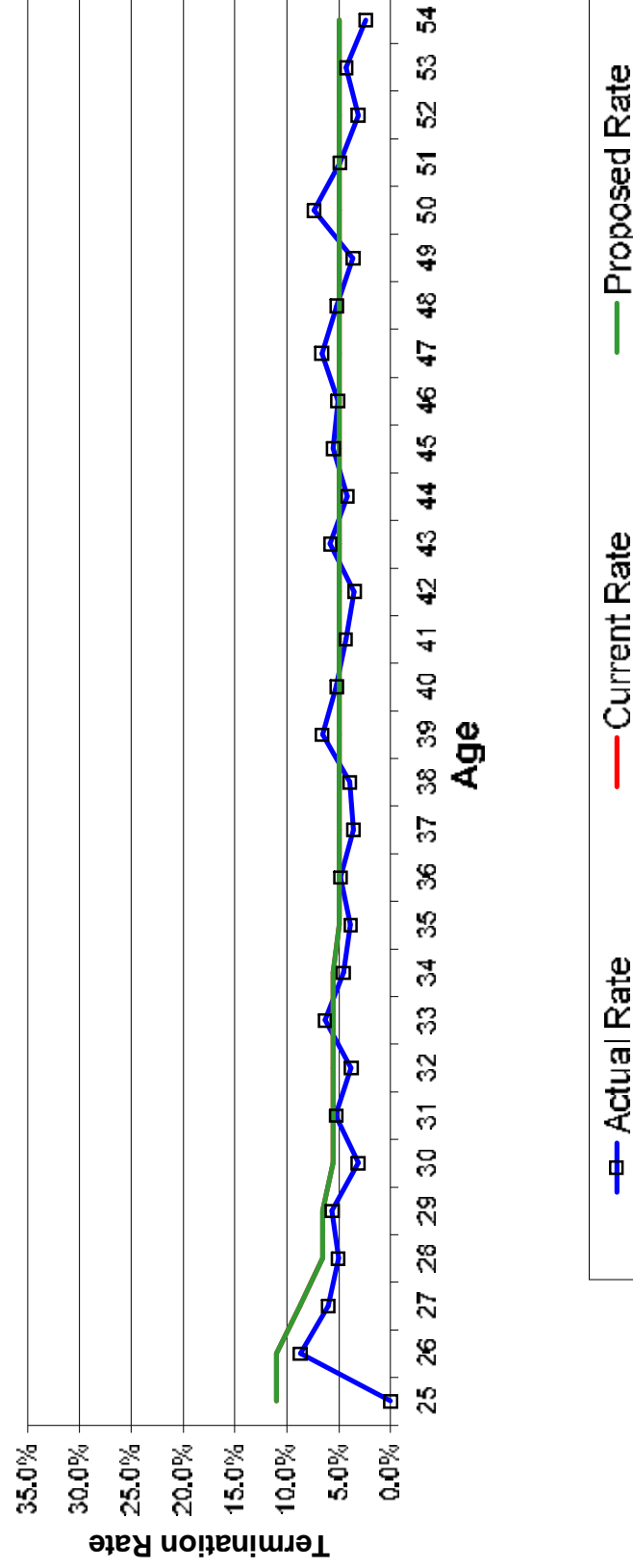
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-9

Termination of Employment

Regular Membership - Males - 7-8 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	52	569	569
Actual/Expected		92%	92%

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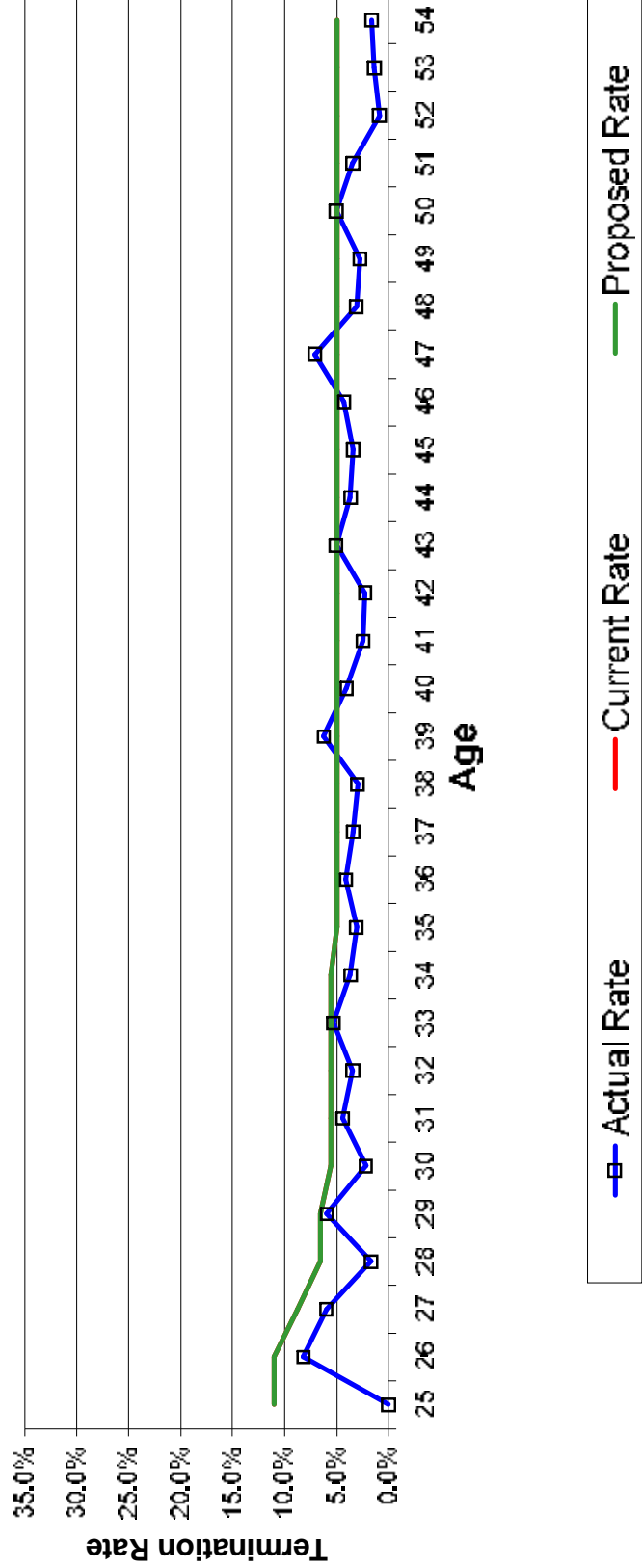
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-10

Termination of Employment

Regular Membership - Males - 7-8 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	10,931	15,210	15,210
Actual/Expected		72%	72%

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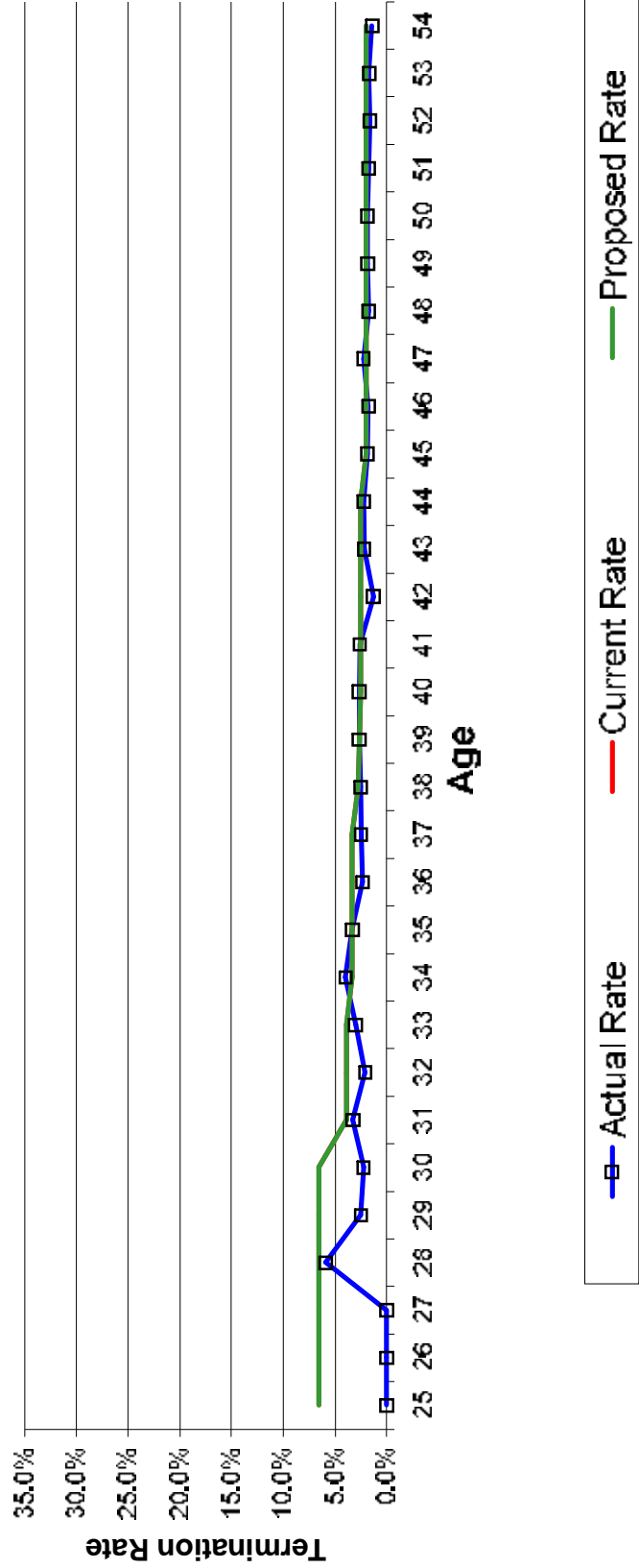
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-11

Termination of Employment

Regular Membership - Males - Over 8 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,463	1,670	1,670
Actual/Expected		88%	88%

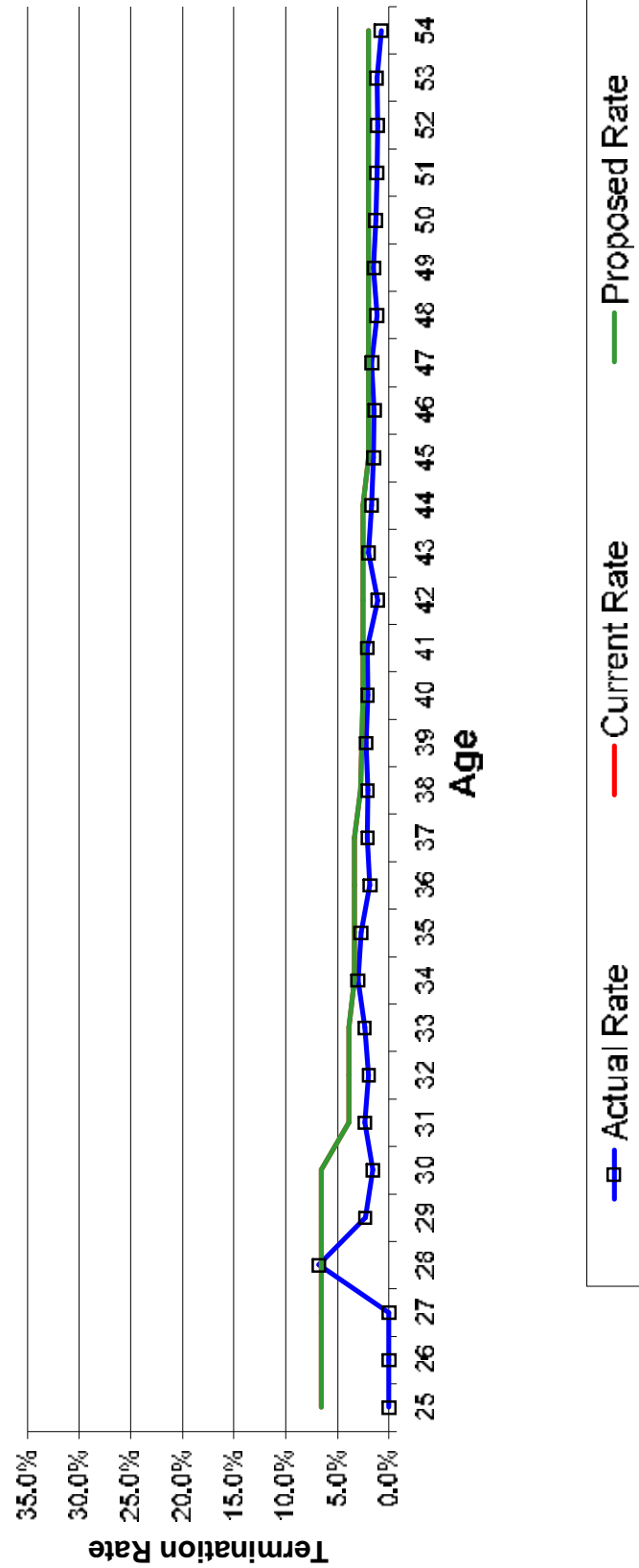
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-12

Termination of Employment

Regular Membership - Males - Over 8 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	85,389	133,135	133,135
Actual/Expected		64%	64%

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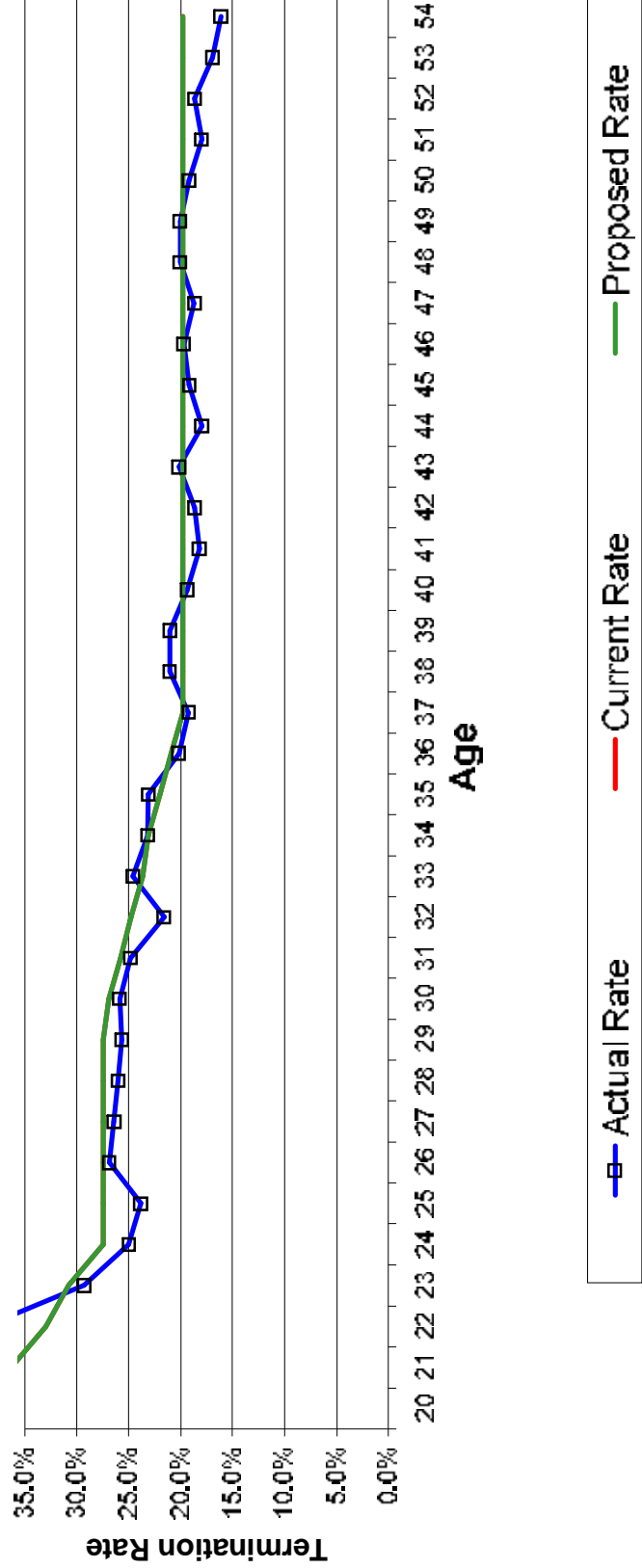
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-13

Termination of Employment

Regular Membership - Females - Under 2 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	12,292	12,564	12,564
Actual/Expected		97%	97%

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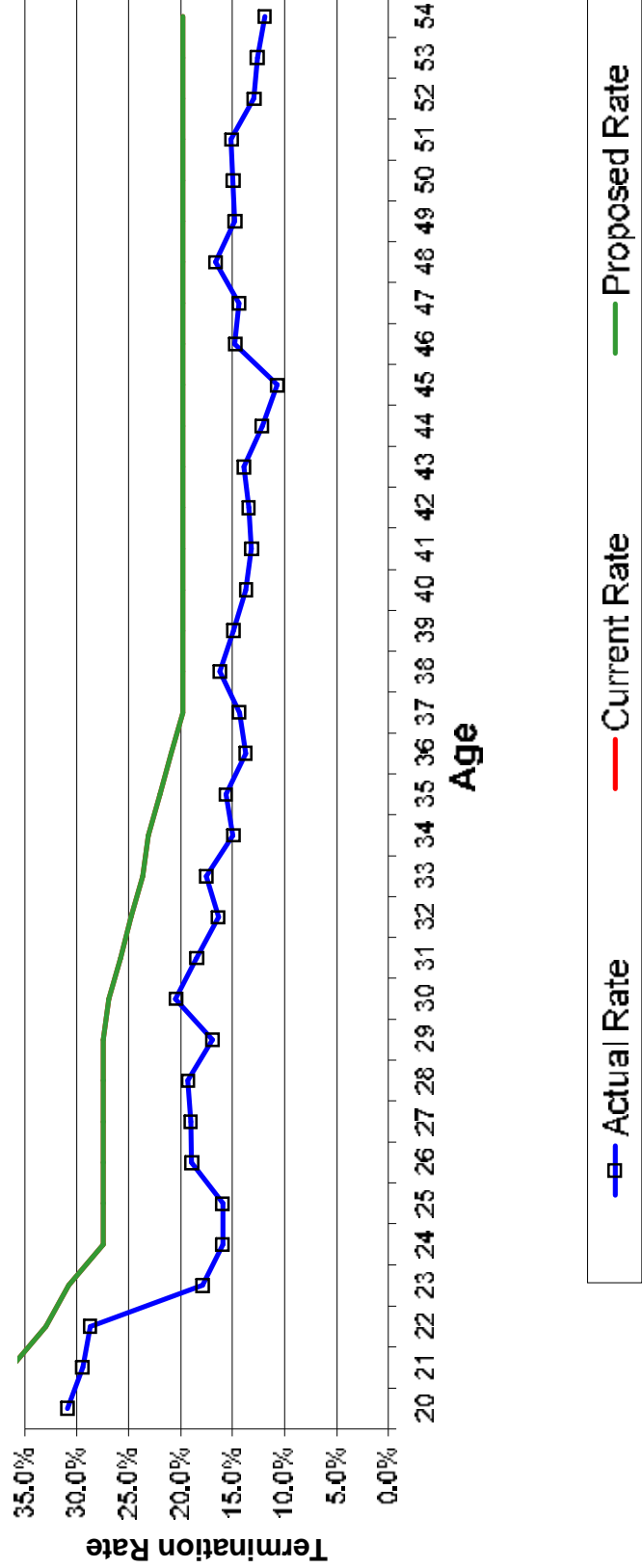
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-14

Termination of Employment

Regular Membership - Females - Under 2 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	8,389	12,404	12,404
Actual/Expected		68%	68%

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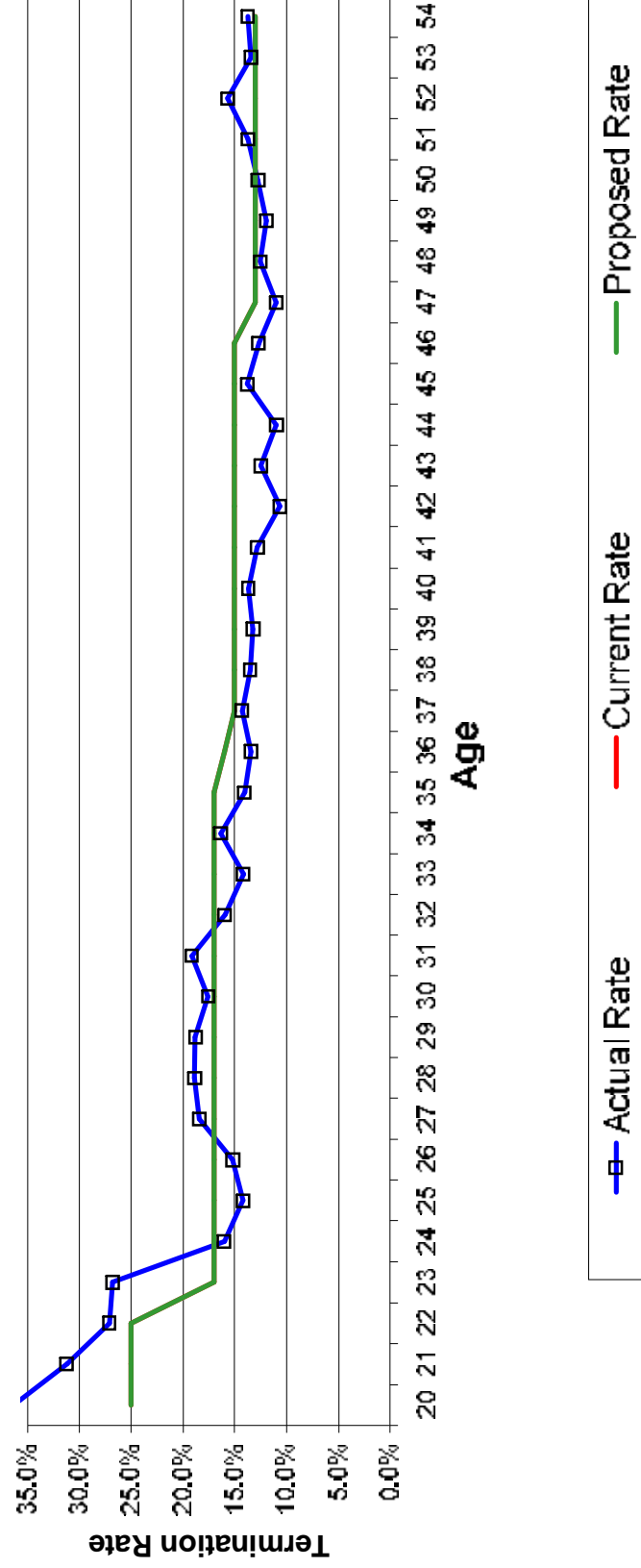
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-15

Termination of Employment

Regular Membership - Females - 2 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	4,074	4,297	4,297
Actual/Expected		95%	95%

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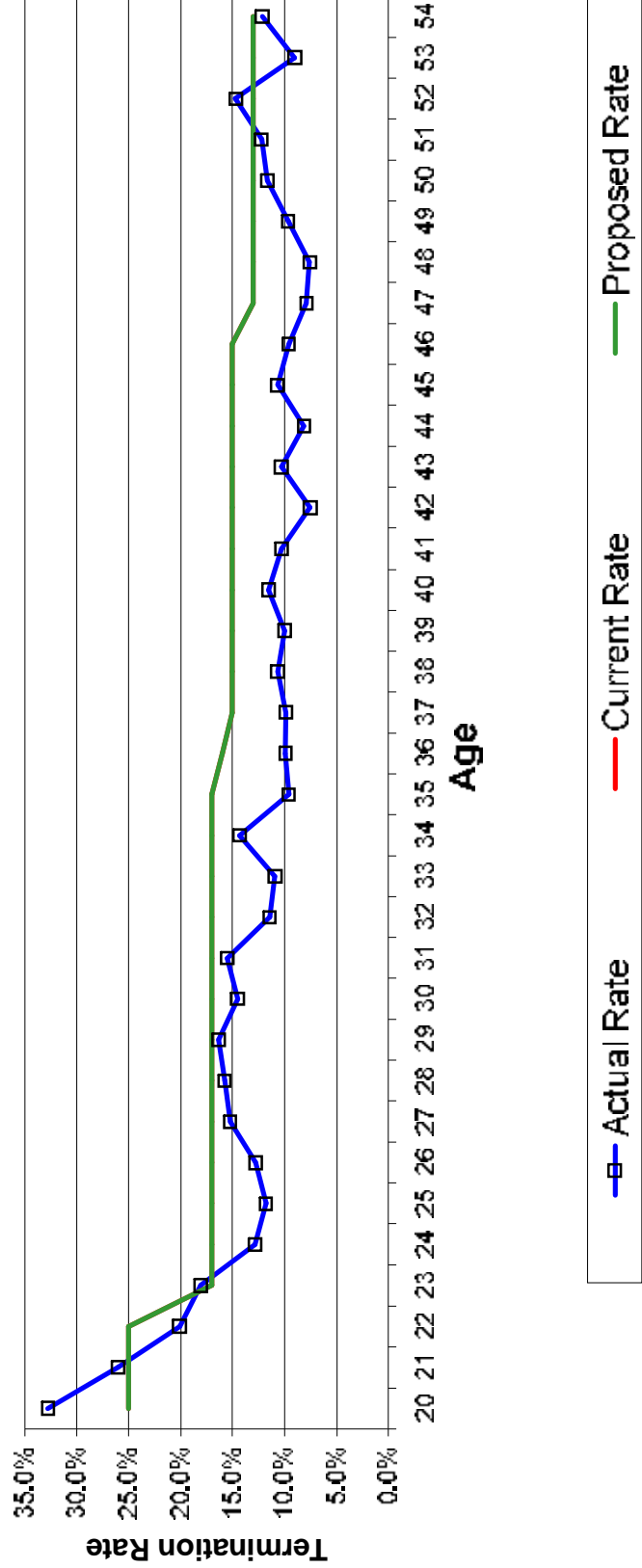
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-16

Termination of Employment

Regular Membership - Females - 2 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	12,766	16,879	16,879
Actual/Expected		76%	76%

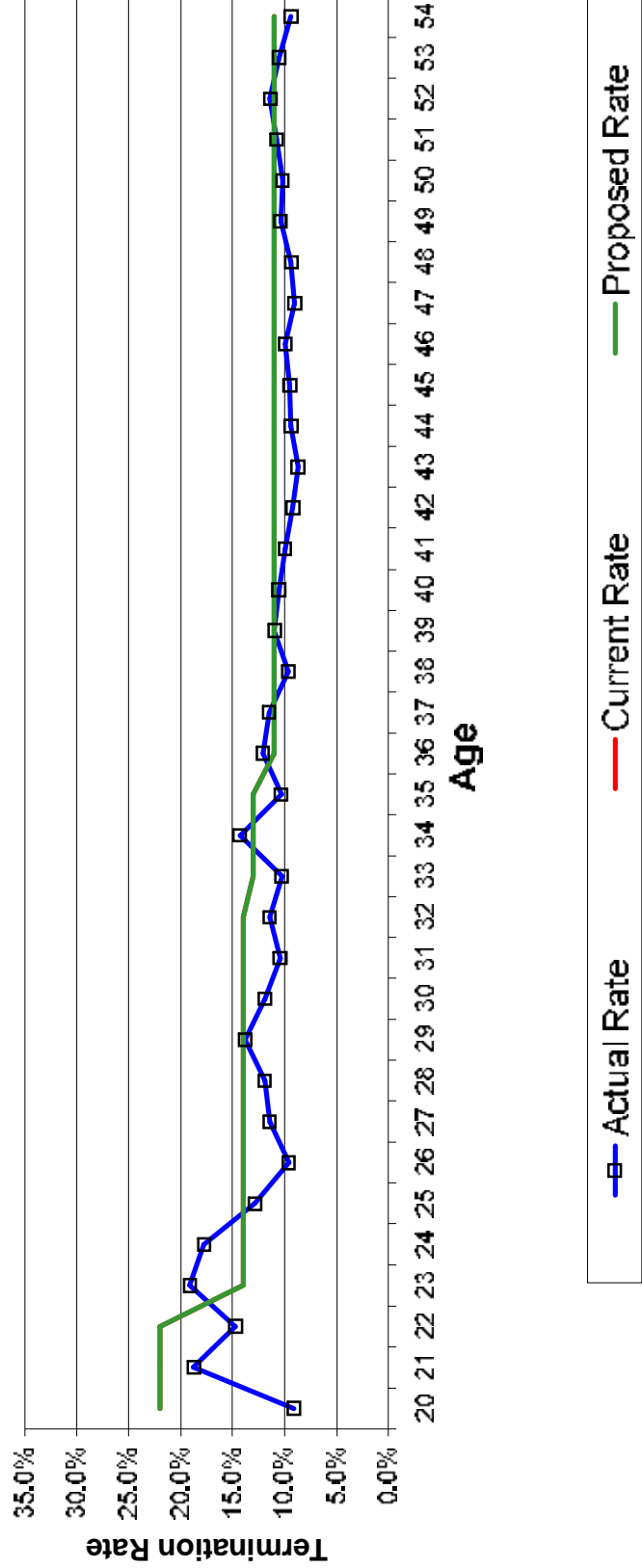
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-17

Termination of Employment

Regular Membership - Females - 3 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,605	2,937	2,937
Actual/Expected		89%	89%

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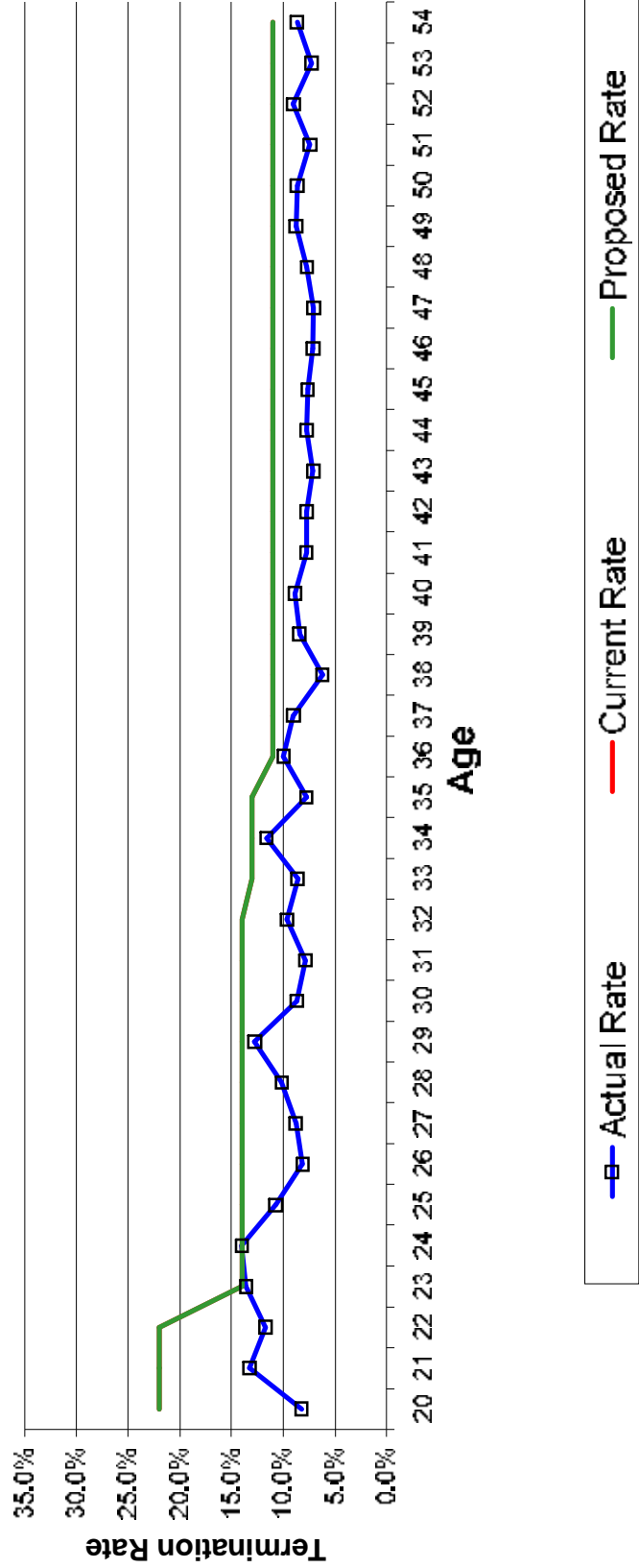
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-18

Termination of Employment

Regular Membership - Females - 3 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	13,430	18,984	18,984
Actual/Expected		71%	71%

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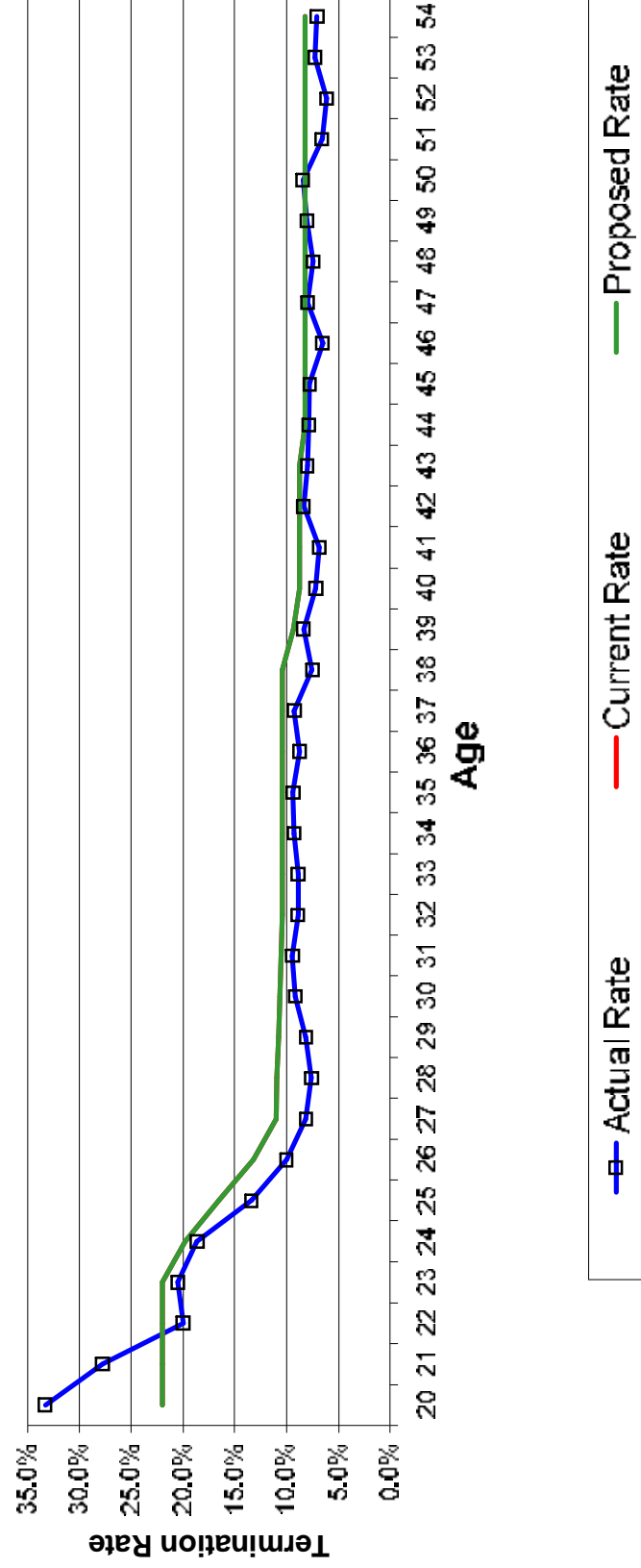
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-19

Termination of Employment

Regular Membership - Females - 4-6 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	4,478	5,257	5,257
Actual/Expected		85%	85%

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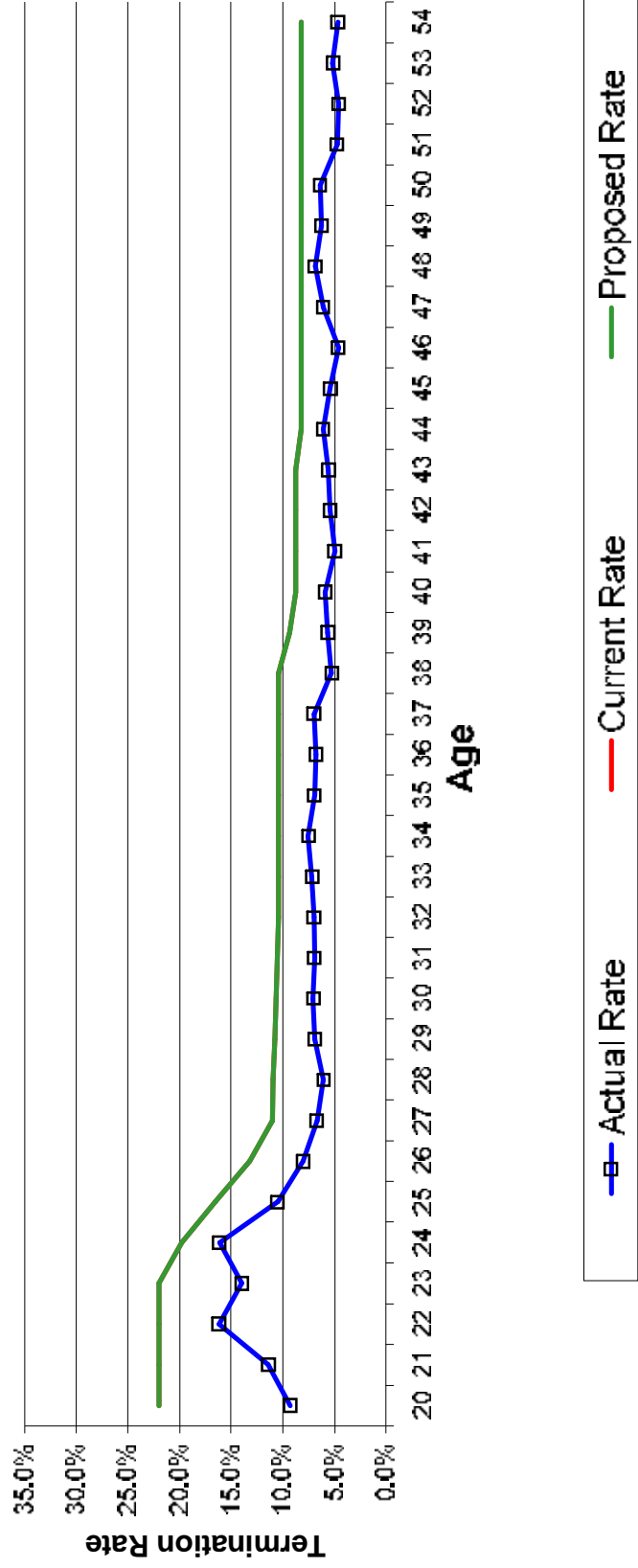
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-20

Termination of Employment

Regular Membership - Females - 4-6 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	39,670	61,403	61,403
Actual/Expected		65%	65%

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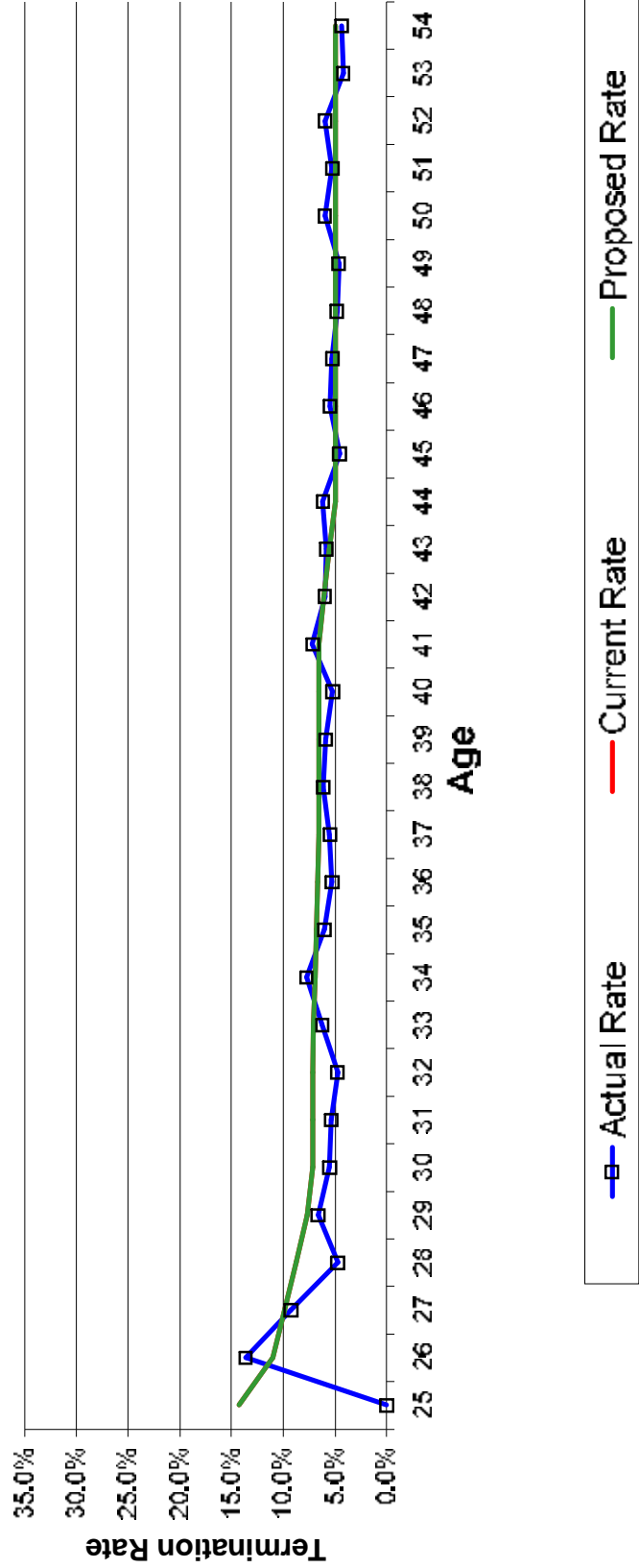
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-21

Termination of Employment

Regular Membership - Females - 7-8 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,485	1,592	1,592
Actual/Expected		93%	93%

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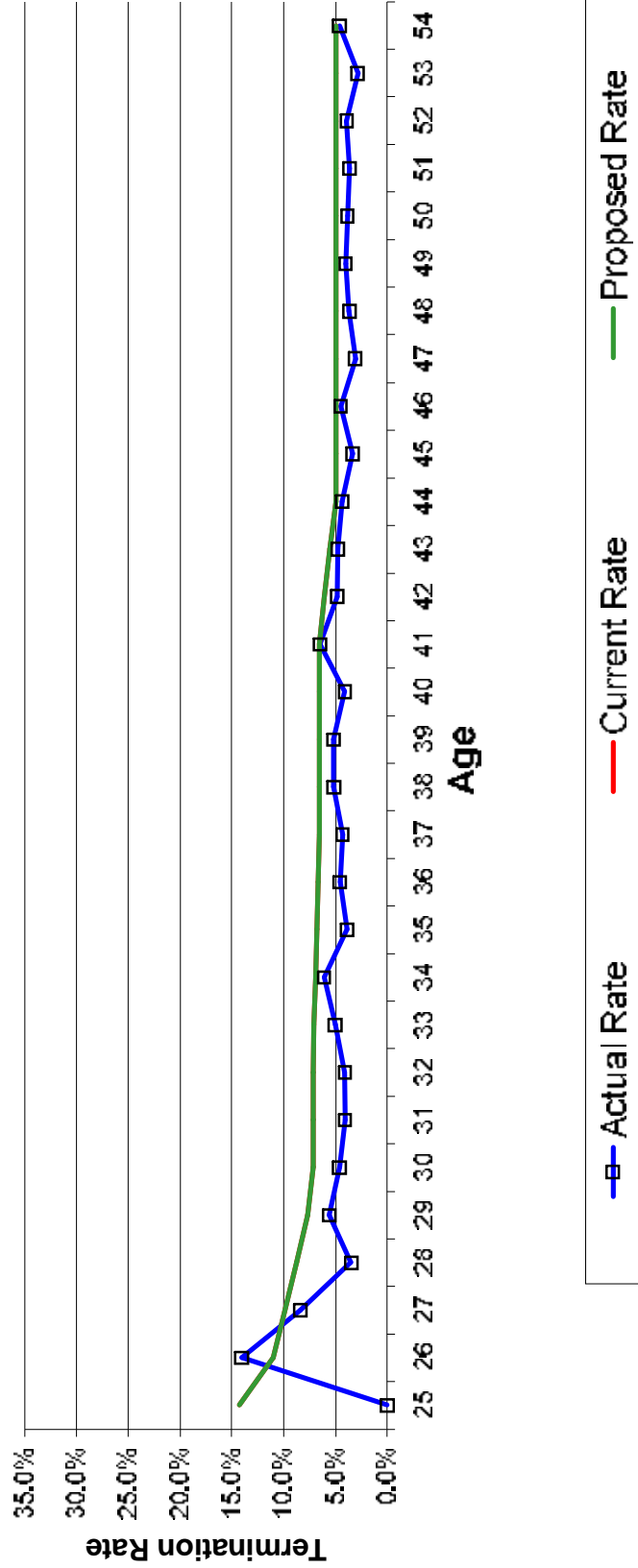
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-22

Termination of Employment

Regular Membership - Females - 7-8 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	22,825	31,513	31,513
Actual/Expected		72%	72%

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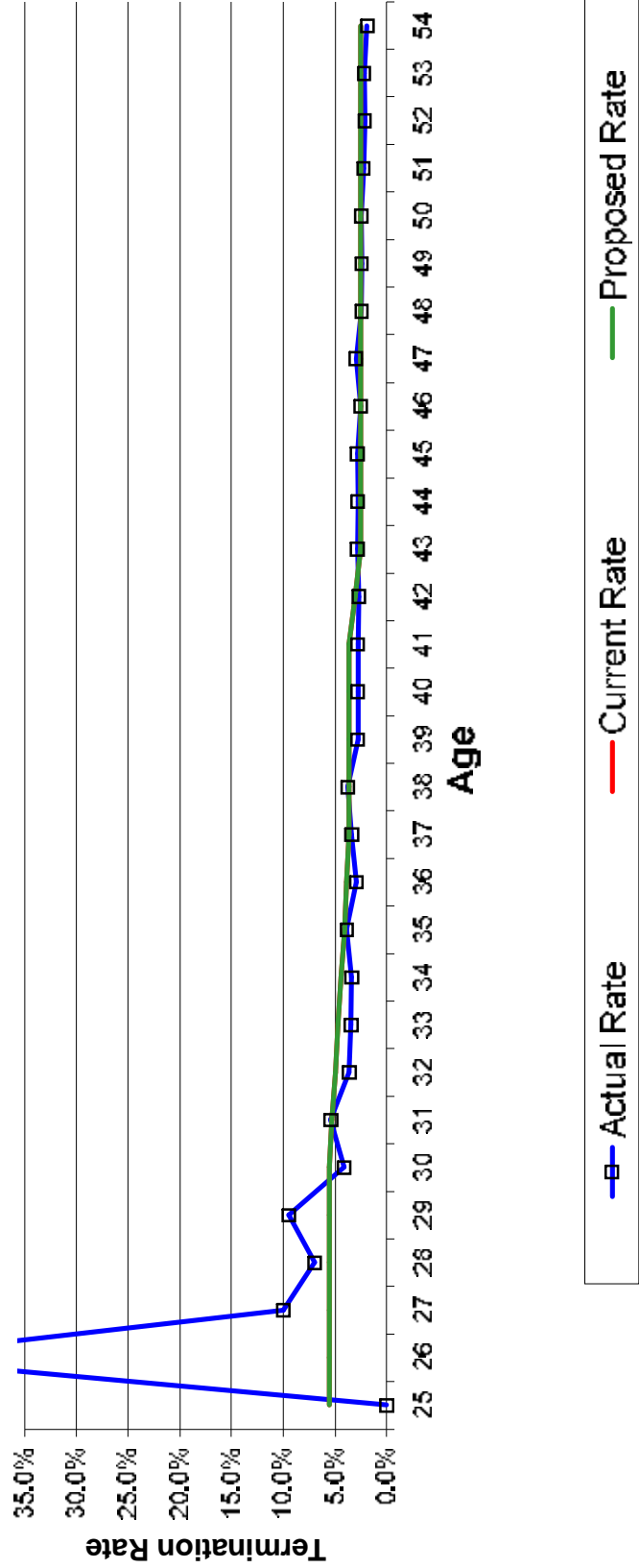
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-23

Termination of Employment

Regular Membership - Females - Over 8 Years



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	3,578	3,909	3,909
Actual/Expected		92%	92%

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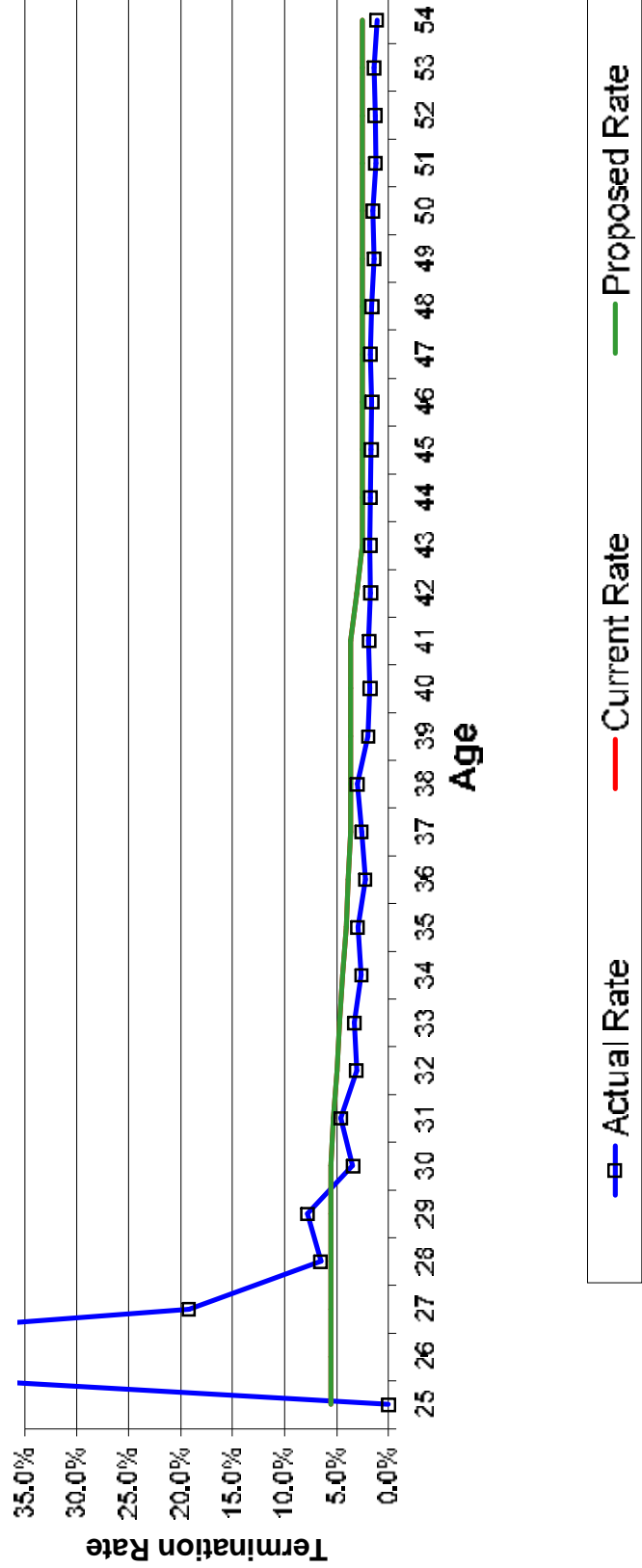
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-24

Termination of Employment

Regular Membership - Females - Over 8 Years (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	140,862	241,928	241,928
Actual/Expected		58%	58%

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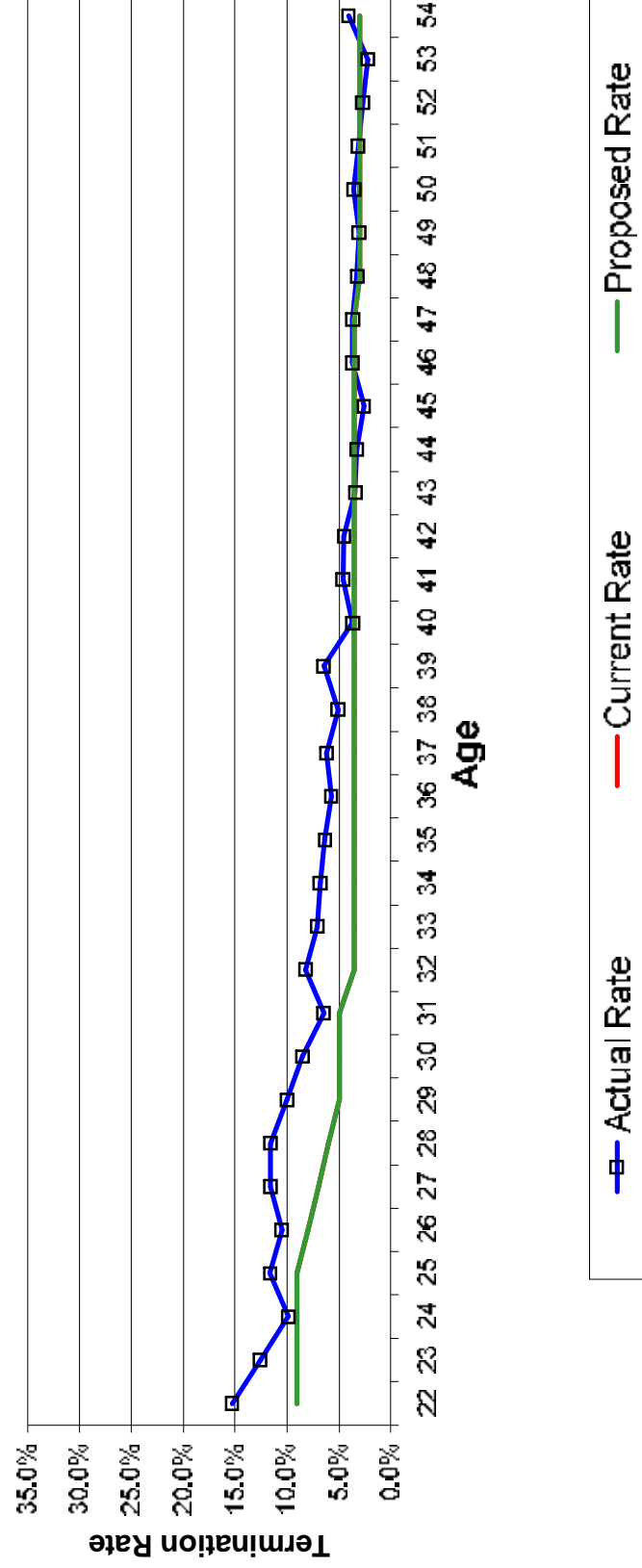
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-25

Termination of Employment

Special Services



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	1,310	940	940
Actual/Expected		139%	139%

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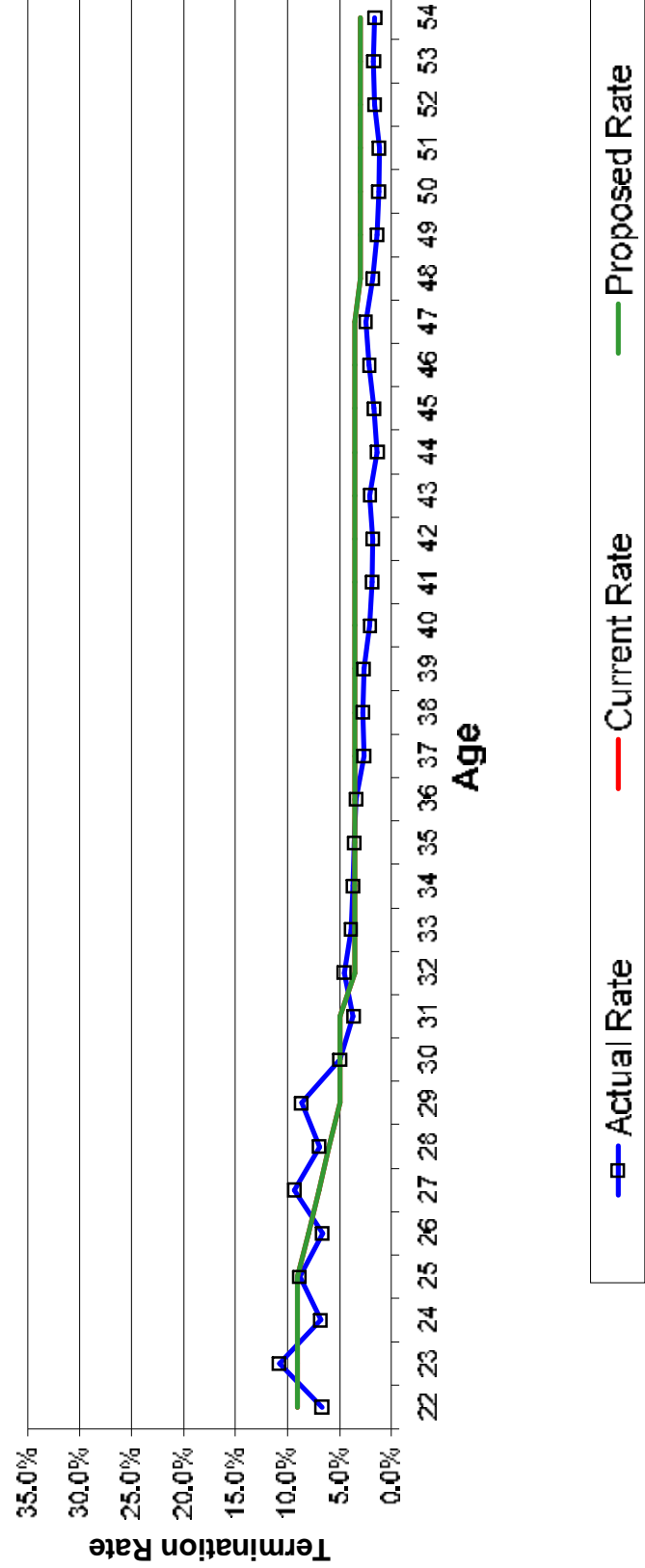
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit F-26

Termination of Employment

Special Services (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	21,772	33,027	33,027
Actual/Expected		66%	68%

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APPENDIX G

PROBABILITY OF ELECTING A VESTED BENEFIT



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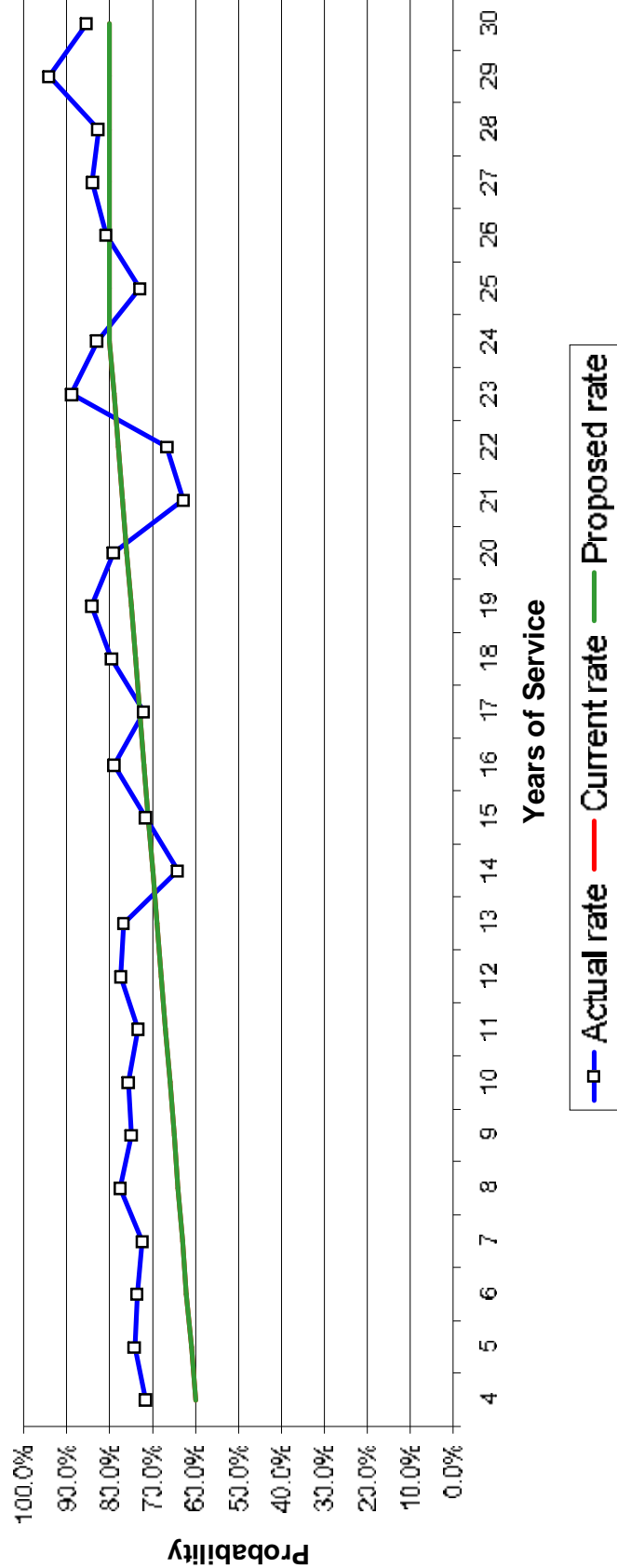
Iowa Public Employees' Retirement System

Experience Study 2001 - 2005

Exhibit G-1

Probability of Electing a Vested Benefit

Regular Membership - Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	2,295	2,026	2,026
Actual/Expected		113%	113%

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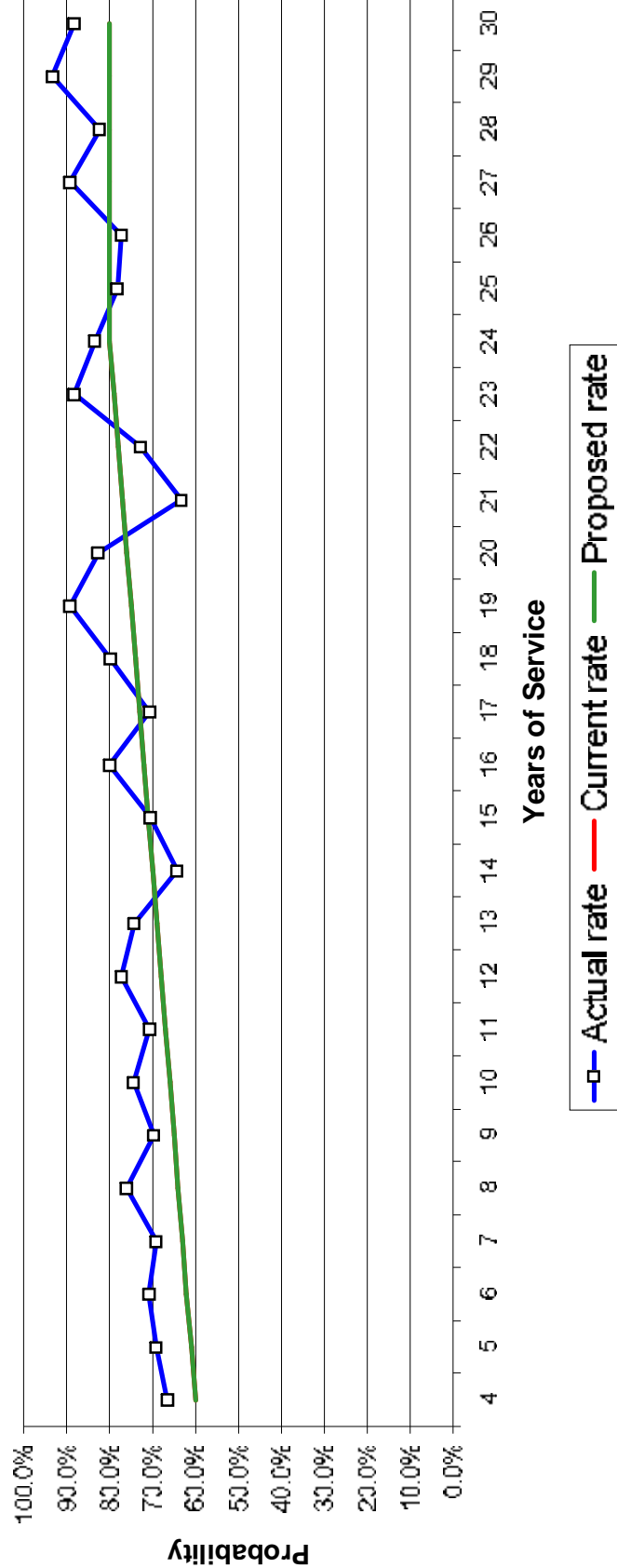
Iowa Public Employees' Retirement System

Experience Study 2001 - 2005

Exhibit G-2

Probability of Electing a Vested Benefit

Regular Membership - Males (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	76,846	72,004	72,004
Actual/Expected		107%	107%

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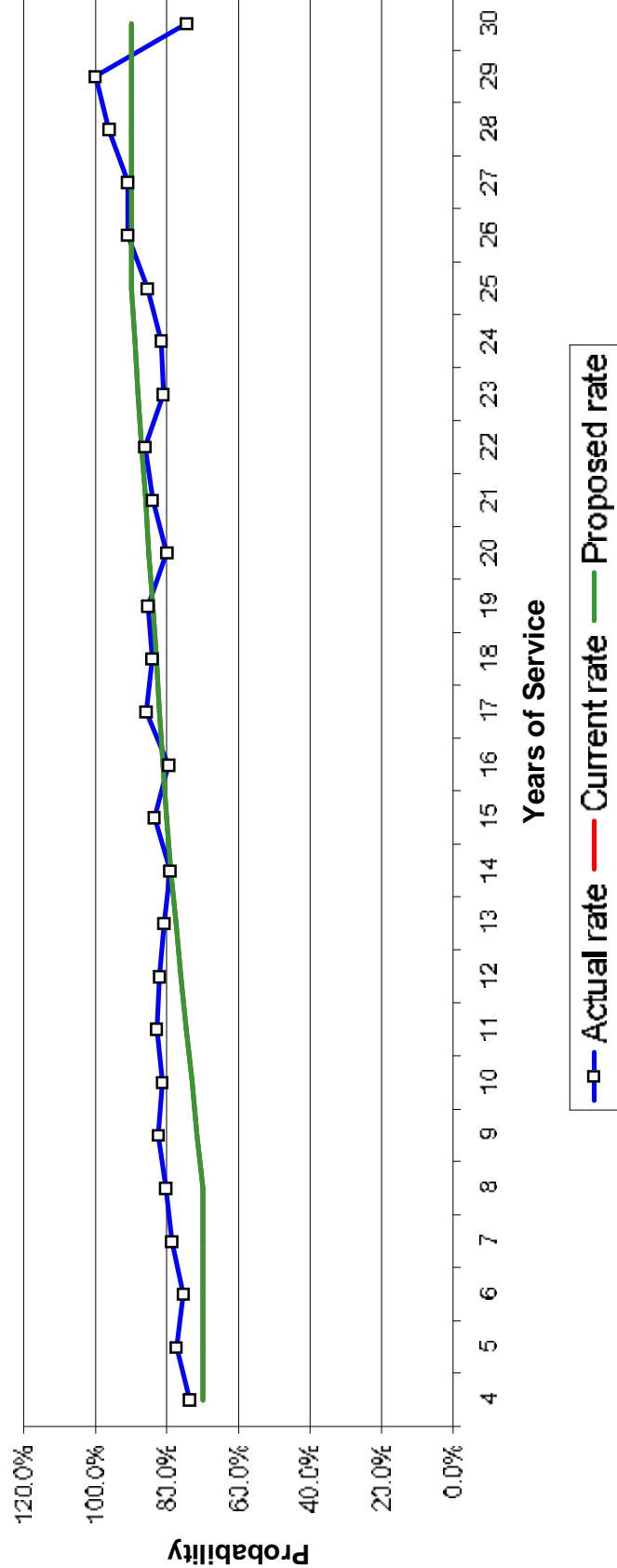
Iowa Public Employees' Retirement System

Experience Study 2001 - 2005

Exhibit G-3

Probability of Electing a Vested Benefit

Regular Membership - Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	6,246	5,809	5,809
Actual/Expected		108%	108%

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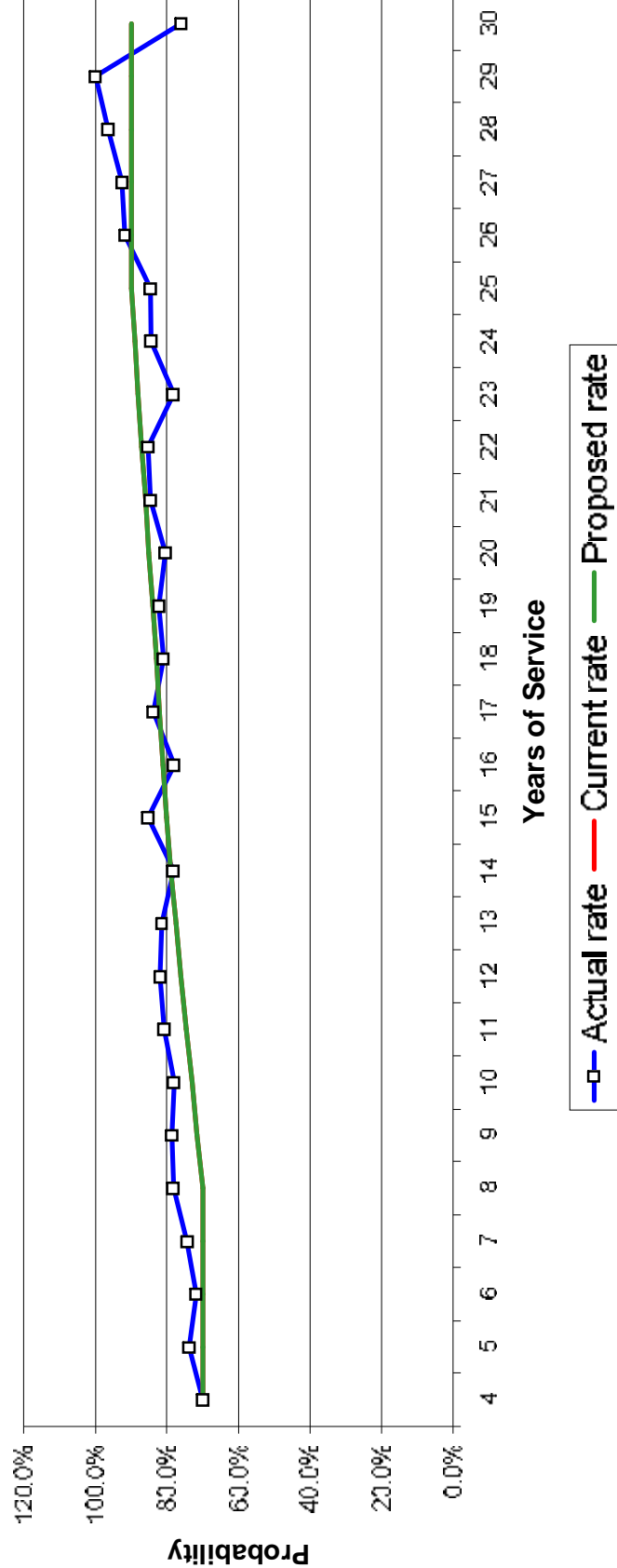
Iowa Public Employees' Retirement System

Experience Study 2001 - 2005

Exhibit G-4

Probability of Electing a Vested Benefit

Regular Membership - Females (Weighted)



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	132,217	129,494	129,494
Actual/Expected		102%	102%

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APPENDIX H

TOTAL SALARY INCREASE



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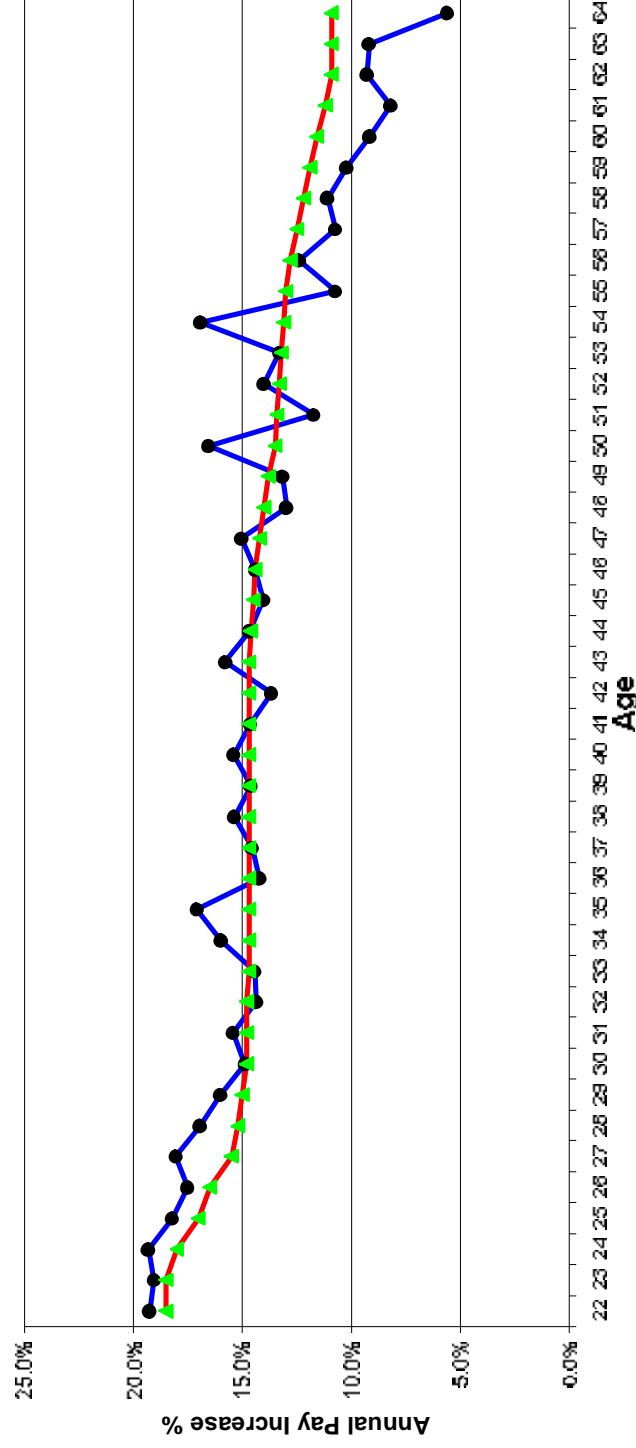
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-1

Salary Increases

Under 2 Years of Service



—●— Actual Pay Increases —▲— Assumed Pay Increases

Total Salary Increases	Actual 15.6%	Expected - Current Assumptions 15.2%
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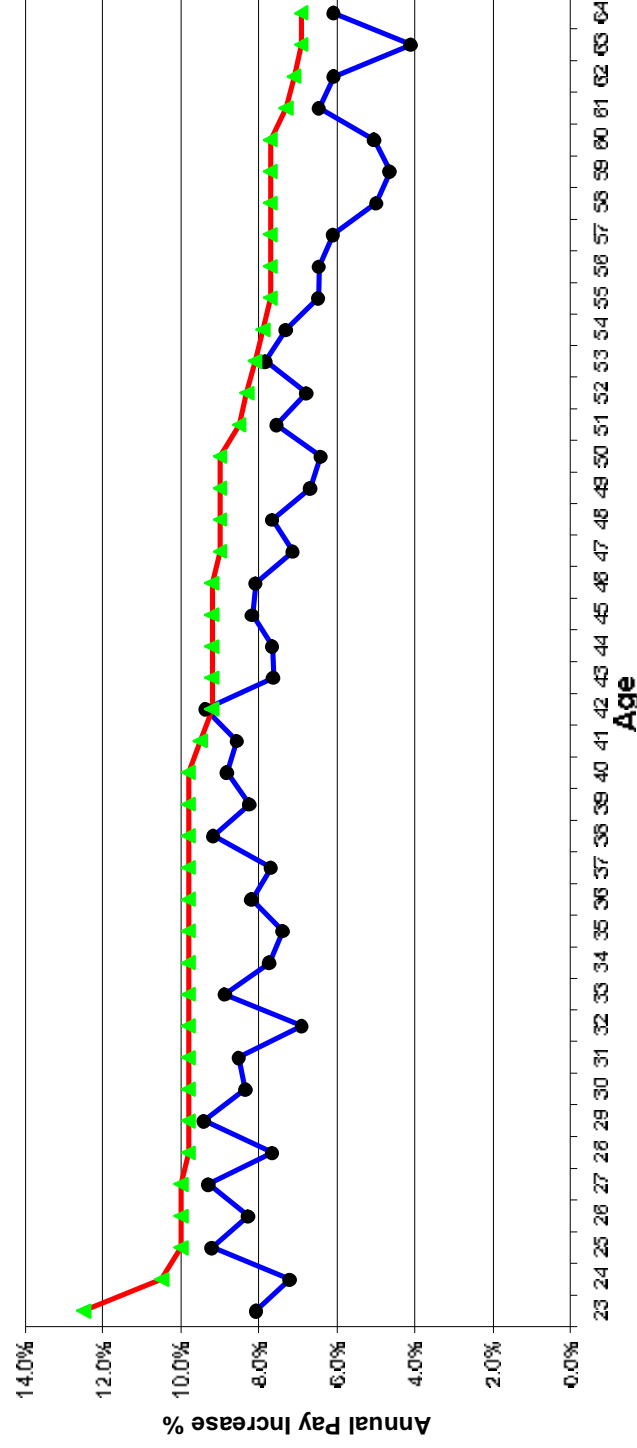
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-2

Salary Increases

2 Years of Service



—●— Actual Pay Increases —▲— Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	7.9%	9.6%

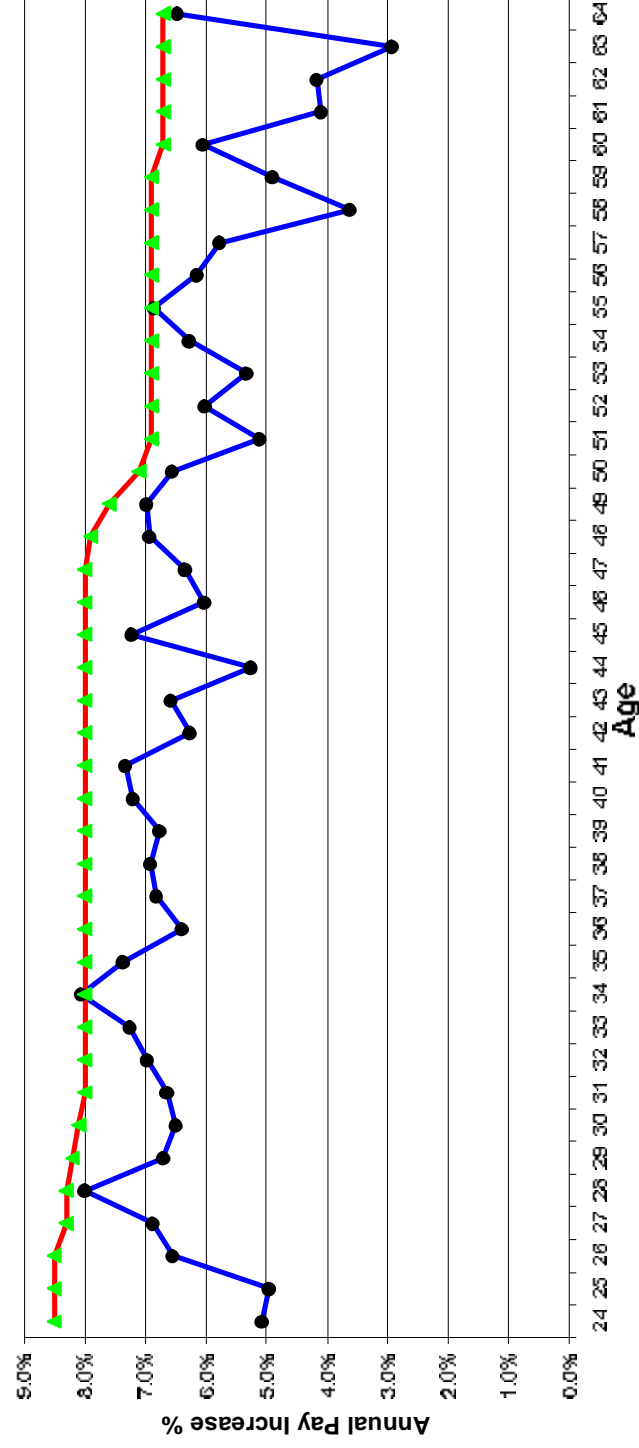
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-3

Salary Increases

3 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	6.5%	7.9%

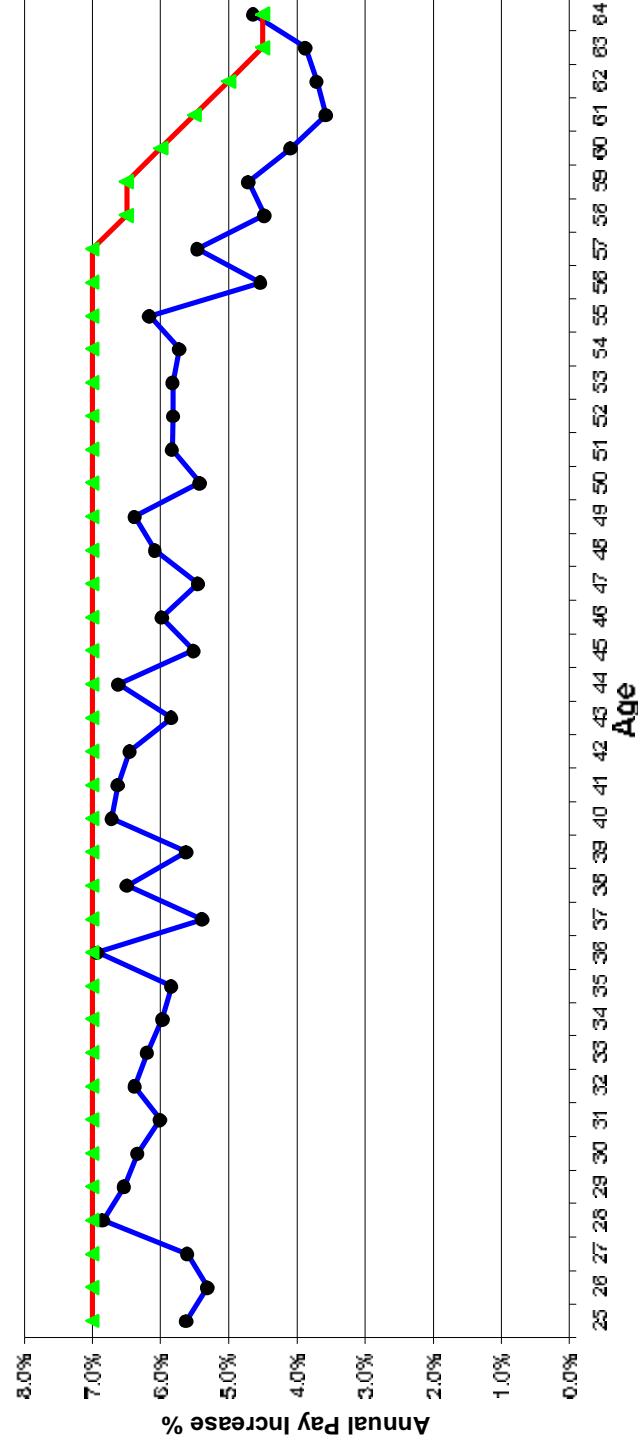
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-4

Salary Increases

4-5 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	6.0%	7.0%

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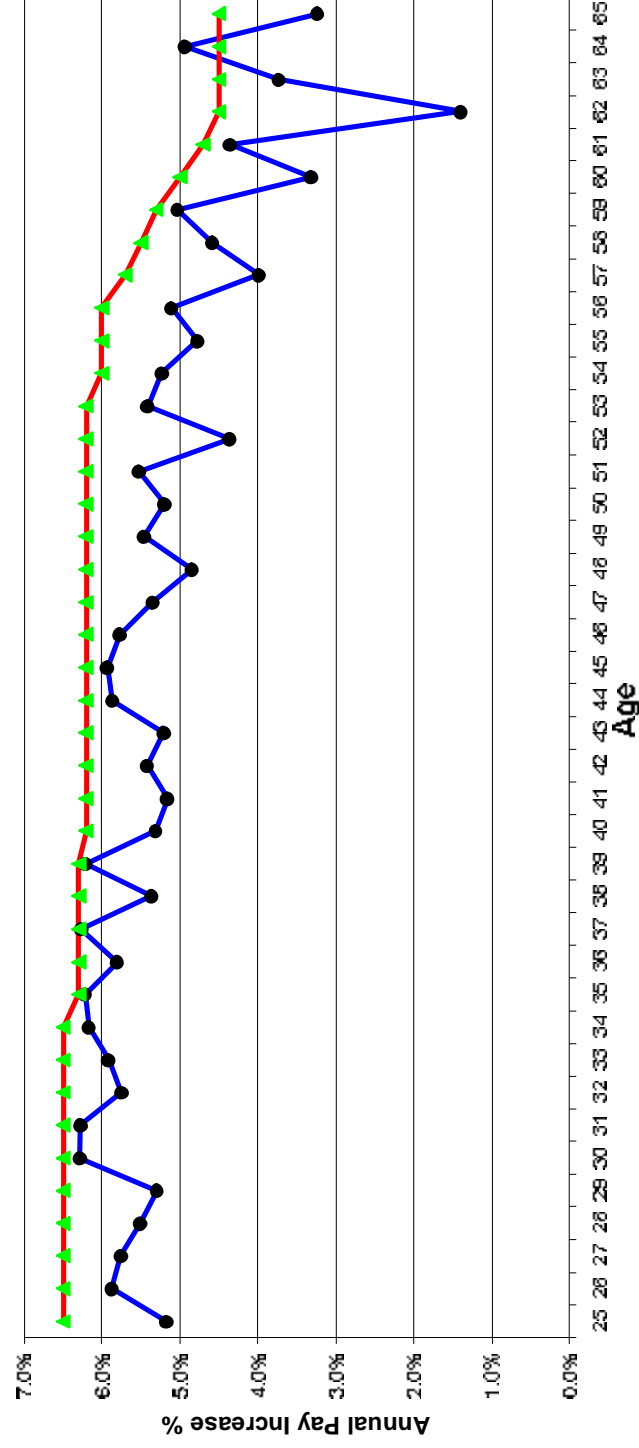
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-5

Salary Increases

6-7 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	5.6%	6.3%

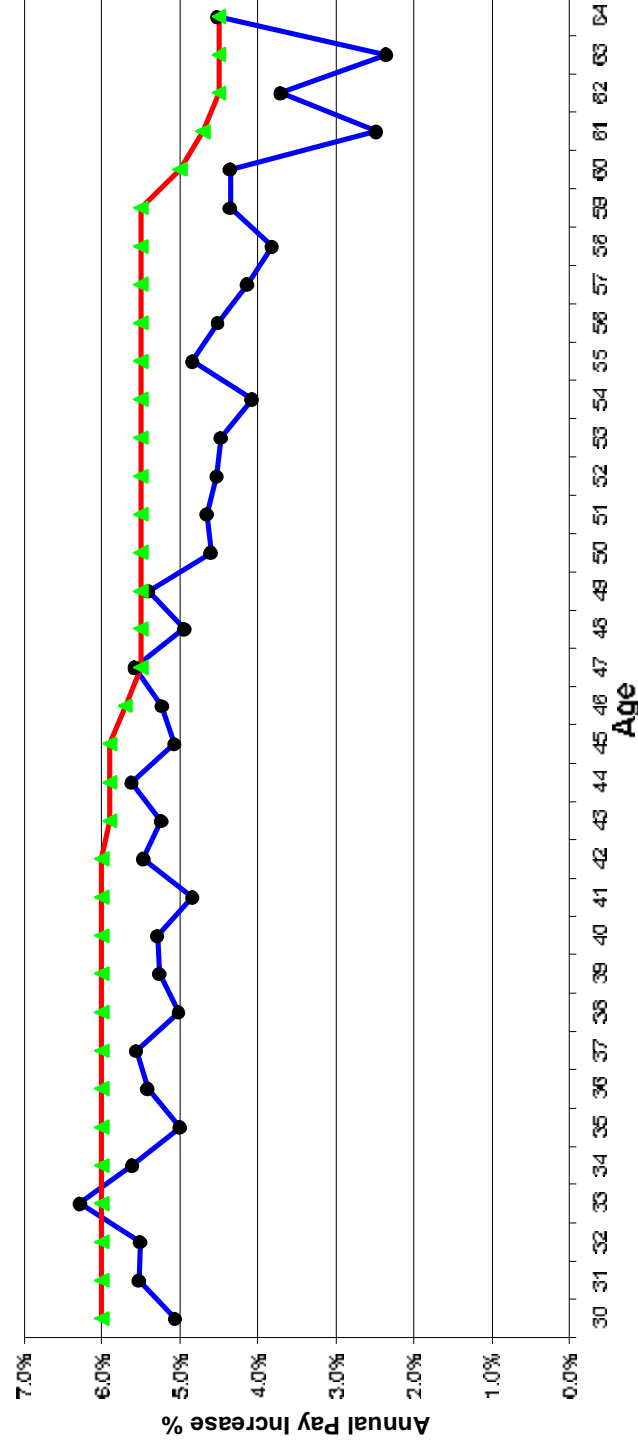
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-6

Salary Increases

8-10 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	5.1%	5.8%

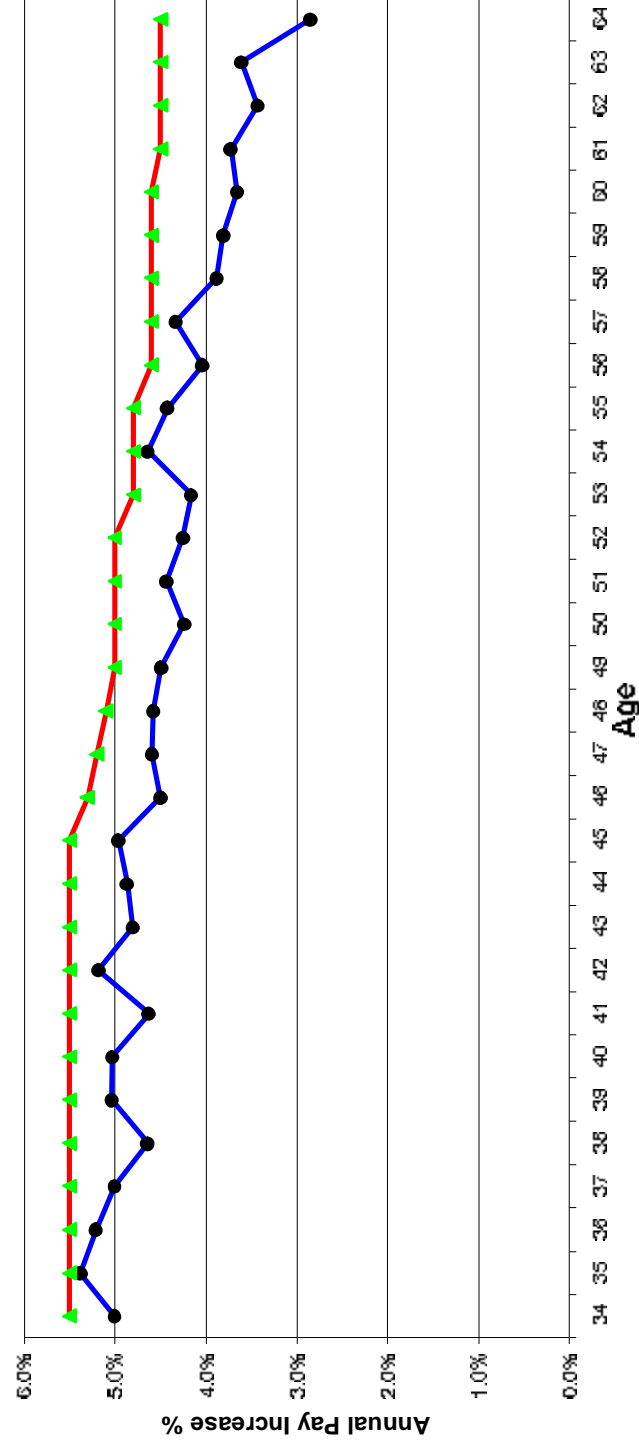
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-7

Salary Increases

11-15 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	4.7%	5.2%

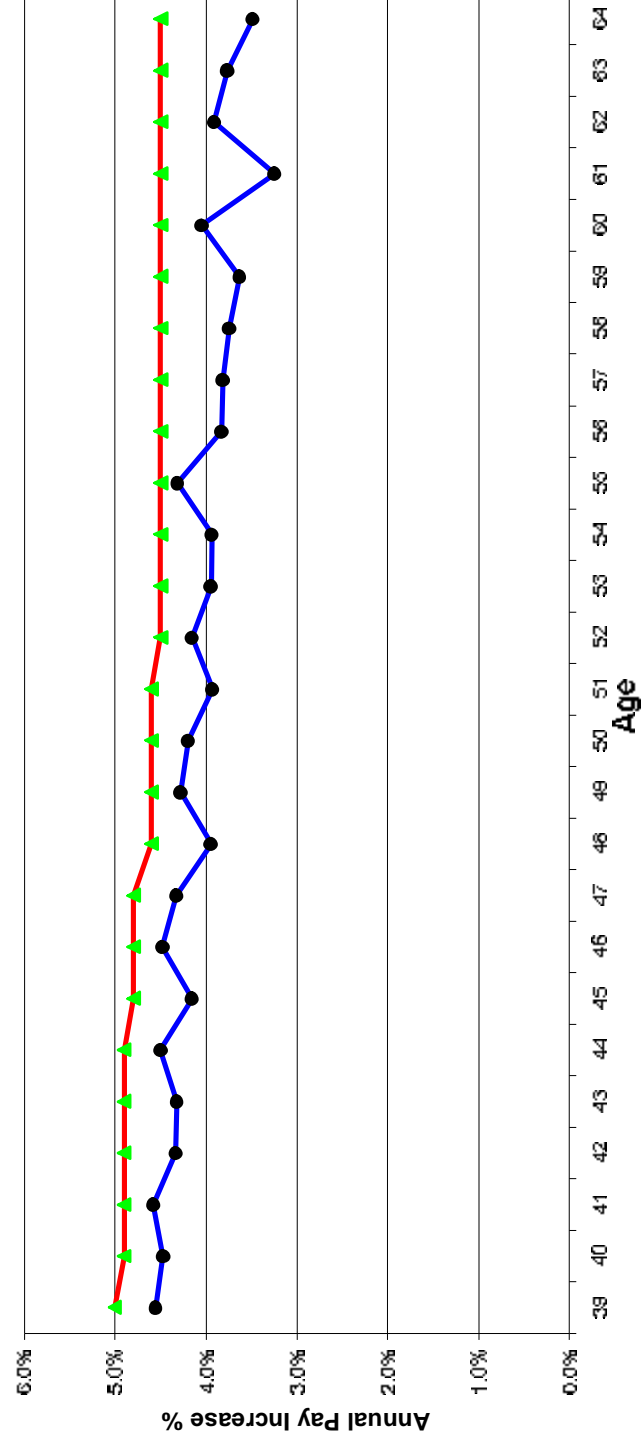
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-8

Salary Increases

16-20 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	4.2%	4.7%

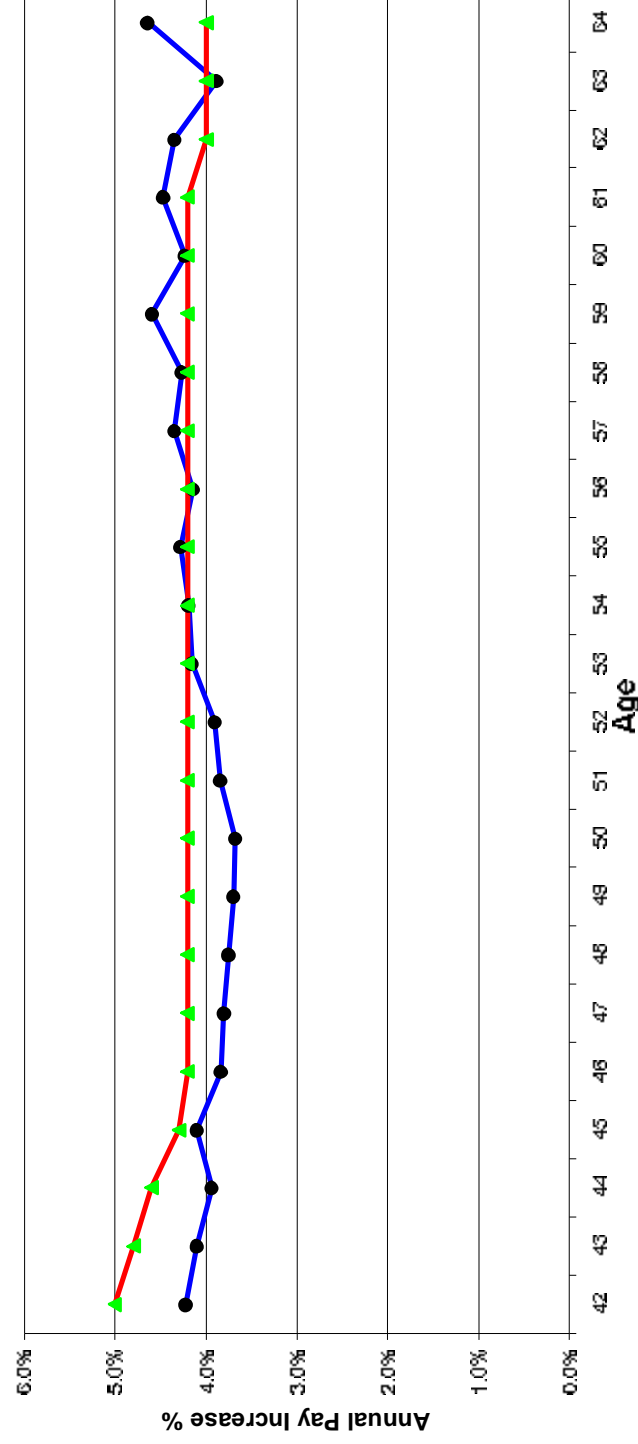
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-9

Salary Increases

Over 20 Years of Service



● Actual Pay Increases ▲ Assumed Pay Increases

Total Salary Increases	Actual	Expected - Current Assumptions
	4.0%	4.2%

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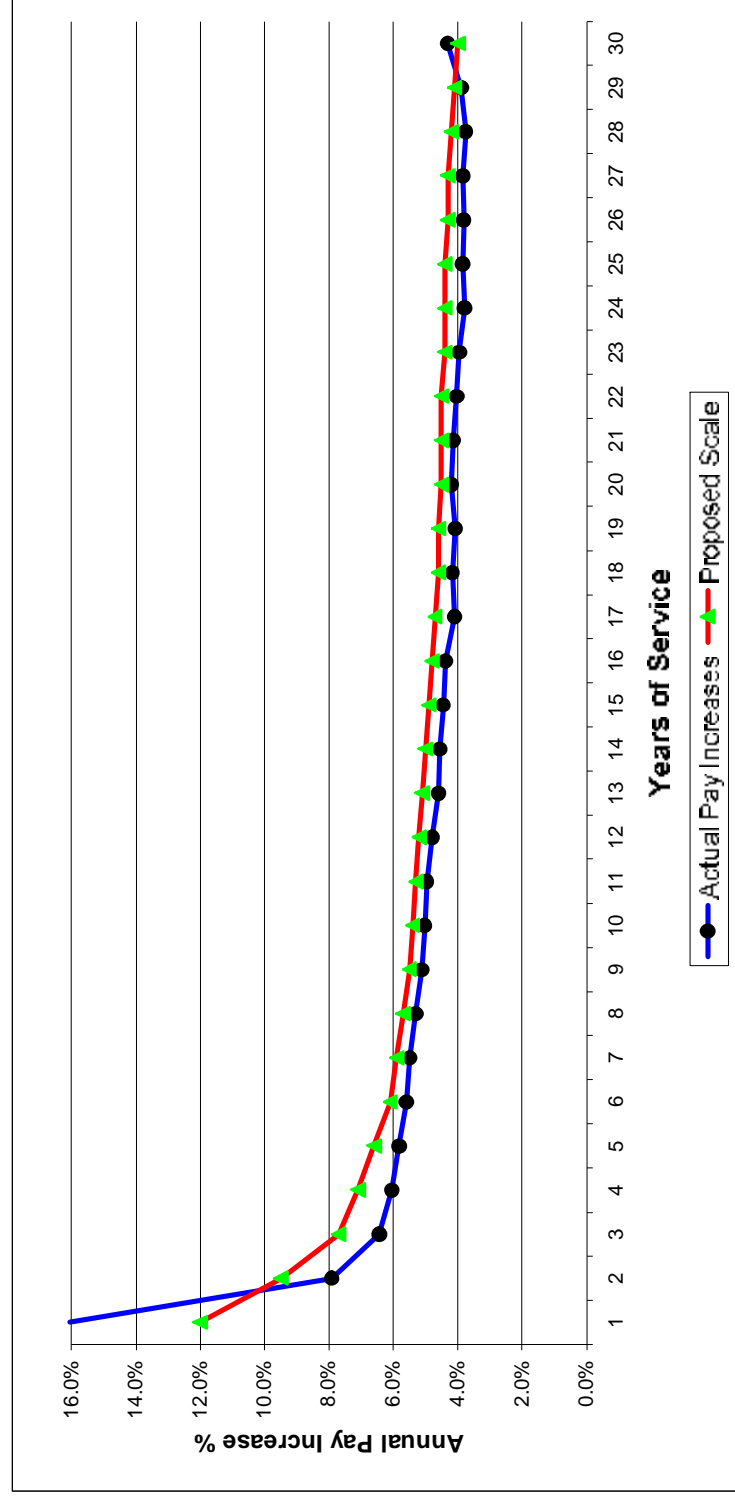
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-10

Salary Increases

Regular Membership



Total Salary Increases	Actual	Expected - Proposed Assumptions
	5.4%	5.7%



Milliman

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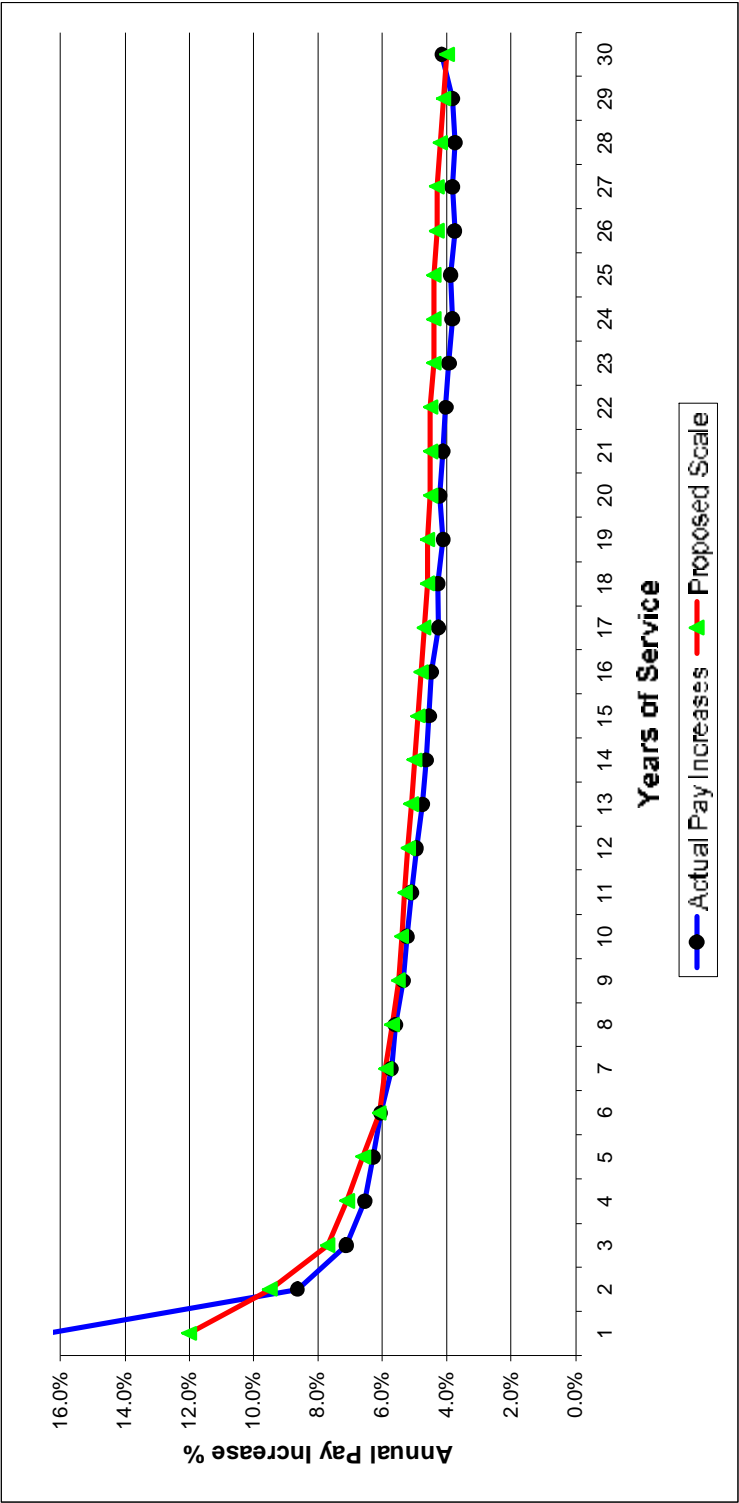
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-11

Salary Increases

Regular Membership Aggregated with Prior Study



Total Salary Increases	Actual	Expected - Proposed Assumptions
	5.6%	5.7%

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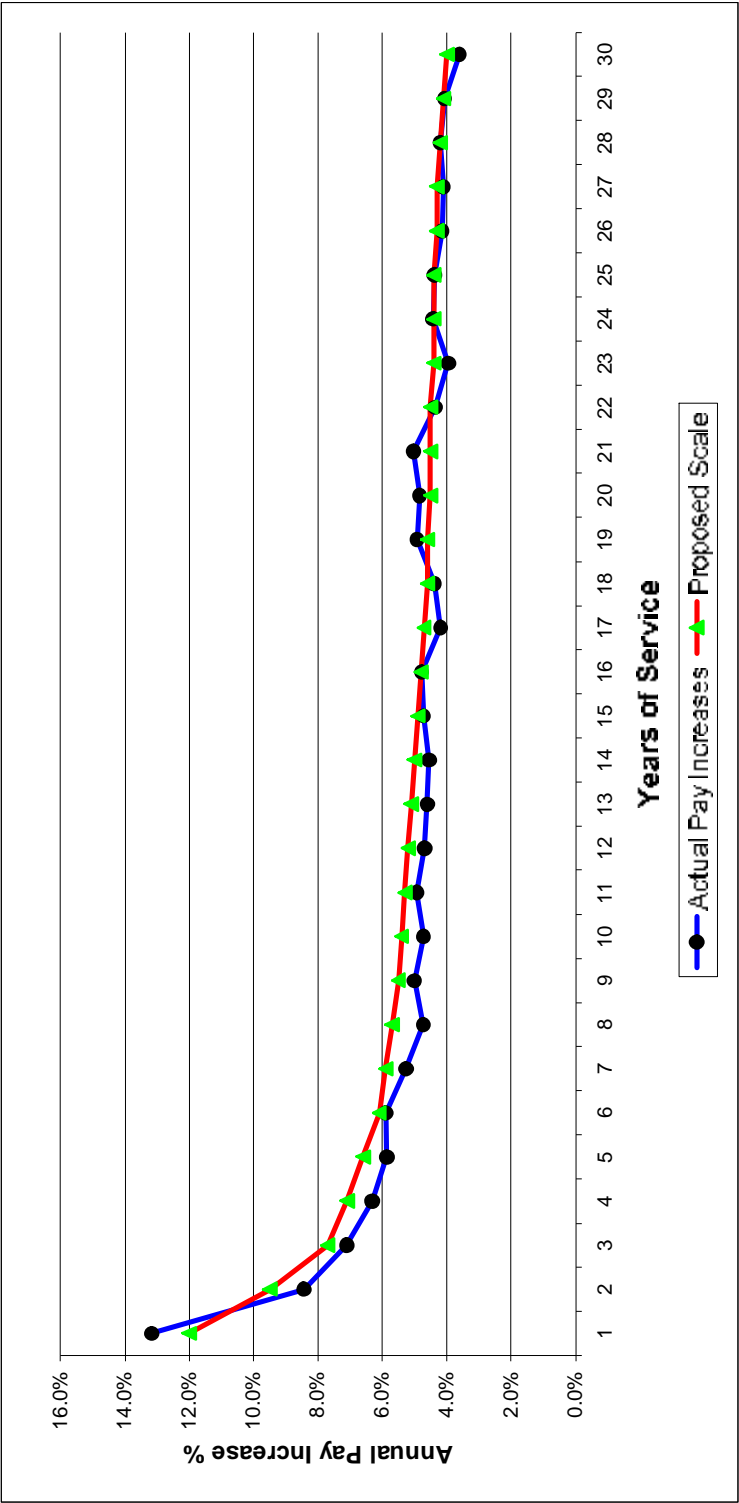
Iowa Public Employees' Retirement System

Experience Study 2001-2005

Exhibit H-12

Salary Increases

Special Services



Total Salary Increases	Actual	Expected - Proposed Assumptions
	5.5%	5.9%

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